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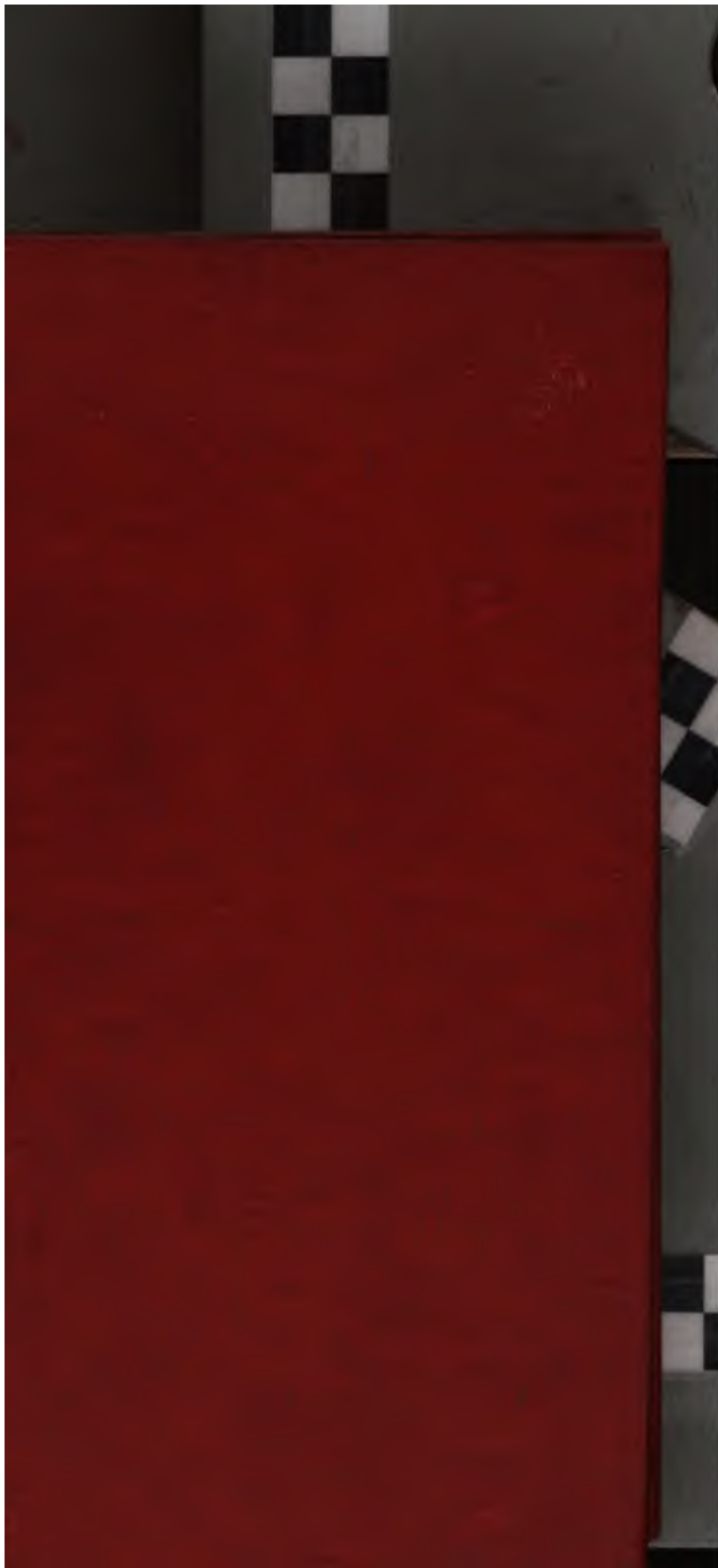
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A TREATISE

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Thuja Occidentalis.

The Therapeutic Uses of Thuja are by PROFESSOR H. W. FFLTER, M. D., Cincinnati, Ohio, Professor of Anatomy, Eclectic Medical Institute, Cincinnati, Author of the Therapy and Materia Medica of the American Dispensatory, Editor of Locke's Syllabus of Materia Medica and Therapeutics, History of the Eclectic Medical Institute.

The Selections are reprints of articles by

LYMAN WATKINS, M. D., D. THOS. LONG, M. D.,
D. G. HIMROD, M. D., A. J. HOWE, M. D.,

And Editorials from The Eclectic Medical Gleaner, The Eclectic Medical Journal, and The Homœopathic News.

The Description, History, Chemistry and Pharmaceutical Record are by JOHN URI LLOYD.

Treatise No. I embraces Thuja Occidentalis.

Treatise No. II embraces Cactus Grandiflorus.

TAKE NOTICE!

This is the first treatise of a series that in a similar way will present the most useful remedies known to physicians. They will also embrace promising drugs that are little known or that are the subject of inquiry by physicians. The first edition of this pamphlet included Cratægus, which has been transferred and will become a part of a subsequent treatise.

Drug Treatise, Number I.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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THUJA OCCIDENTALIS.
Natural Size. Made for
this publication.

Thuja Occidentalis.

(ARBOR VITÆ—Tree of Life.)

The name is also spelled *Thuya* and pronounced in accordance.

An evergreen, coniferous American tree, from 20 to 50 feet in height. It grows on rocky banks of rivers and in low swamps, from Pennsylvania northward. Thuja is used as a hedge plant.

History.—Thuja was introduced into Europe before 1600, and early attained a European reputation. Boerhaave employed distilled water of Thuja; Hahnemann introduced Thuja into the Homœopathic school; Peter Kalm, 1753, reports that the bark and leaves were used locally in Canada; Schoepf, in 1785, commended it in scurvy; and other early authorities testified to its value. It was introduced into Eclecticisim by Dr. Dickey, in 1862, through an editorial by Dr. Scudder, and then lay dormant until Prof. Howe, in 1880, began his study of the drug, which attained its popularity through his enthusiastic commendation of it. Professor Howe used only our Specific Medicine Thuja.

Part Used.—The fresh leaves and young twigs carry the fullest characteristics of the drug.

Constituents.—By distillation with steam, from 0.5 to 1.0 per cent. of a colorless volatile oil is obtained. It is of camphoraceous odor, ~~destitute of astringency, and resembles~~ oil of cedar or tansy. The chemical constituents, ~~dextro-pinene, lævo-fenchone,~~ dextro-thujone, pinipicrin, thujin, and other substances, have no established individual therapeutical values.

PHARMACEUTICAL PREPARATIONS.

Specific Medicine Thuja.—This is the most conspicuous of the Thuja preparations, and introduced the drug generally through the writings of Professor A. J. Howe, M. D., for whom we first made the remedy. It is an alcoholic liquid of a deep green color, a fragrant Thuja odor, and an aromatic, balsamic, astringent taste. It was prepared for Professor Howe as free from inert extractives as possible, for he wished to inject it in hydrocele, and otherwise use it in surgery, where impurities were not to be tolerated. To this ~~preparation~~ he gave the name Lloyd's Thuja, in order that physicians

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wishing to employ the identical remedy might not be disappointed. When the preparation came into demand we placed it in our list of Specific Medicines, thus making our Specific Thuja, and Lloyd's Thuja of Professor Howe, identical. The great value of Thuja in surgery and as an antiseptic wash is due Professor Howe, and was established by the action of Specific Thuja. When Specific Thuja is dropped into water it imparts a milkiness and a balsamic odor, added in larger amount it produces a greenish, oily precipitate. It must not be confounded with an ordinary tincture or an extractive laden fluid extract of which numerous representatives are found in commerce.

Aqueous Thuja.—In some instances where alcohol is not admissible, and a fatty substance not desirable, an aqueous solution of Thuja is employed under the name Felter's Thuja, Professor Felter having first used it. This preparation is an aqueous, highly astringent solution of the soluble principles of Thuja, practically destitute of the resin and fixed oils of Thuja. It has a dark brown color and a fragrant Thuja odor. It is not a watery extract, but an elegant pharmaceutical preparation, in which the final menstruum is aqueous.

Long's Thuja.—Owing to the irritating action of alcohol in the eye or on broken surfaces where the stimulating action of Thuja is desired we devised for Dr. D. Thomas Long, Topeka, Kansas, a preparation that is of unctuous condition, free from alcohol, and known as Long's Thuja, to be used where alcohol would be objectionable and oleaginous agents admissible. Long's Thuja is a dark green, bland, stimulating oleaginous substance possessing the full characteristic odor and flavor of the drug. When non-alcoholic Thuja is ordered we give this preparation.

Ointment of Thuja.—Is an oleaginous preparation less than half the drug value of Long's Thuja. It has a lighter color.

Oil of Thuja.—By distillation of Thuja in water, as has been said, a colorless, volatile oil of camphoraceous odor is obtained. It is destitute of astringency, resembles the oils of cedar and tansy, and is not characteristic of Thuja as a remedy.

An extractive, astringent and stimulating, fixed Oil of Thuja of a deep green color, of a strong aromatic odor, has been made by us for some years under the name Oil of Thuja. This, mixed with petrolatum, can be used to make a stimulating ointment, similar to Long's Thuja, but inferior.

There is no official Fluid Extract of Thuja.

The preparations of Thuja herein described carry the full values of the drug, and as adapted to their several fields have established this drug in *American therapy*.

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MEDICAL PROPERTIES AND USES OF THUJA AND ITS PREPARATIONS.

BY PROFESSOR HARVEY W. FELTER, M. D

Thuja has become one of the most important remedies employed in Eclectic practice, both for its local and internal effects. Specifically it acts upon the vascular, cutaneous and mucous tissues, stimulating them to normal activity and in cases of flabby vessels exciting them to contraction, and in cases of cutaneous over-activity restraining hypertrophies and excrescences. Furthermore, it is a decided antiseptic. Its general action may be said to resemble that of the terebinthines, and more particularly that class of which savin is a fair type. Like the latter, if carelessly employed, serious results may follow, showing chiefly in the form of irritation or inflammation.

While Thuja has a special field of action, some forms of administration are to be preferred over others in special cases. In this paper we divide the subject into the therapeutic uses of the *crude drug*, *Oil of Thuja*, *Specific Thuja*, *Long's Thuja*, and *Aqueous Thuja*, and give first the general well-known uses, and follow with conditions in which it is said to be useful, and where well authenticated give credit to the reporter.

Oil of Thuja.—Volatile Oil of Thuja is irritant and like the coniferous oils is capable of producing gastro-intestinal irritation and inflammation. Abortion is reputed to have resulted from its use. Occasionally this remedy is administered for the expulsion of intestinal worms.

Crude Thuja Preparations.—The parts of the plant first employed were the leaves variously prepared by bruising, decoction, and in ointment. Thus a decoction was employed in malaria and the distillate, by Boerhaave, for the relief of dropsy. The bruised leaves and the ointment were early employed for the amelioration of rheumatic pains and swellings. Hahnemann gave it some conspicuity and introduced it into Homœopathy, while Schoepf used the drug in coughs, scurvy, rheumatism and fevers. The present use of Thuja dates from the days of our Civil War when Dr. Dickey, of Ohio, employed the leaves as a discutient in chronic enlargement of scrofulous glands. The bruised leaves (the ointment is to be preferred) are still employed by some physicians as a stimulating dressing for ulcers and condylomata.

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Specific Thuja.—One of the earliest uses of Specific Thuja, and one for which it has earned a well-sustained reputation is that for the restraint and reduction of hypertrophic changes in the mucous and cutaneous tissues. It will deaden and repress fungous granulations, and may be applied to "proud flesh" and "ingrown (!) nail" (overgrown granulations) with considerable success. It has a marked action upon such chronic granulations as those of trachoma, but the remedy is painful and a better application is that of ointment of Long's Thuja (see *Long's Thuja*). On account of its constringing properties it may be employed to retard fungoid granulation and ulceration in epithelioma (not curative), bed-sores, sloughing wounds, fistulous openings, and to overcome the stench of senile and other forms of gangrene. Few mild agents have a greater reputation for the destruction of various kinds of papillomata and for condylomata about the nates. It does not cure all cases but is best adapted when there is softness and foul exudations. It cures many, though not all, cases of genital or venereal warts. It may be applied full strength to the surface or hypodermatically. Employed as stated it is generally conceded to be the best agent for the removal of warts (verruccæ) on any part of the body. Specific Thuja, Aqueous Thuja, or the ointment, should be given a fair and prolonged trial in fissure of the anus. The Specific medicine is liable to aggravate the case at first, but the persistent use of it has cured some cases of this annoying malady.

Specific Thuja topically is a remedy for hemorrhage. It has checked hemorrhage from malignant growths, hemorrhoids (by hypodermatic injections in some instances) and it has given at least temporary relief in vascular and prolapsed rectum. Itching, sore, bleeding moles, have disappeared under its use and it has controlled hemorrhage in "bleeders." In such cases it has been applied locally after the extraction of teeth, for nasal hemorrhage and for incised wounds (E. P. Whitford). In this connection we would suggest its topical and internal use in purpura hemorrhagica, bearing in mind that the dose must be small, for it is well authenticated that such a state has been caused by the careless use of oil of juniper. G. W. Harvey endorses it as a remedy for bleeders, having controlled with it umbilical hemorrhage in a child of hereditary hemorrhagic diathesis, two children in the same family having died of umbilical hemorrhage, 10 and 15 days respectively after birth. Specific Thuja, full strength, was used by means of a compress. The use of Specific Thuja for the cure of bulging nævi, or "mother's marks" was first advocated by Prof. Howe, and others have testified to its merits in such cases.

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Bullington reports the cure of a child in three weeks treated from birth with compresses of Specific Thuja. Combined with chloroform and menthol it makes a good styptic for use in dental surgery. No remedy appears to have given more success and less discomfort in the cure of hydrocele than this one when employed as first suggested by Prof. Howe. It must not be understood that the operation is wholly painless, for in some instances great pain is provoked. Perhaps carbolic acid is less painful but Thuja does not poison; an accident which may be looked for from carbolic acid. The usual method is to tap the distended sac of the tunica vaginalis testis and then to inject two (2) drachms of a solution of one (1) part of Specific Thuja to seven (7) parts of warm sterilized water. The parts are then to be carefully kneaded so that the fluid is made to penetrate every portion of the sac. More or less burning pain ensues together with a greater or less degree of swelling; after subsidence of the latter, if the work has been carefully executed, a cure is found to have resulted from adhesion of the contact surfaces due to the inflammation provoked. Dr. J. Scudder Hull reports the use of full strength Specific Thuja in a case cured by him after failure from an injection of iodine.

Prof. Watkins, was the first to report the value of this agent for cure of urethral caruncle. For this condition Aqueous Thuja is also valuable. Specific Thuja has given marked results in palmar eczema, hereditary and formidable in type, while many report its successful use in chronic dry eczema of furfuraceous character.

Diluted with water, Specific Thuja forms a good application for the relief of gleet, when kept up by reason of granular urethritis; Aqueous Thuja, however, is a better agent and productive of no discomfort. Specific Thuja (diluted) may be employed upon flabby and ulcerated forms of sore throat, and for mild curable forms of diphtheria where the secretions are foetid, but even here the aqueous preparation is to be preferred. By inhalation it has given relief in chronic bronchitis, fetid bronchitis, bronchorrhœa, chronic nasal catarrh, and retro-nasal catarrh.

In all of the foregoing conditions Specific Thuja may be employed in full strength or diluted to meet the exigencies of the case.

INTERNALLY.

Specific Thuja.—Is valued as an internal agent, chiefly in affections of the mucous tracts, and more particularly those of the respiratory and genito-urinary organs. It may be used for hæmoptysis (also by steam inhalation), though we have far better agents, *but for those forms of bronchial troubles with fetid excessive expect-*

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toration it may rank with other terebinthines. Its greatest value internally is for the relief of urinal dribbling of the aged and the young, provided paralysis does not exist in the former or no preputial adhesion or phimosis is present in the latter. In five or six drop doses it relieves nocturnal enuresis in children when merely functional, and in the same sized doses it assists the local action of Aqueous Thuja in gleet when accompanied by granular urethritis. Sometimes the following will serve better in habitual bed-wetting: *R.* Specific Thuja, gtt. xxx; Specific Belladonna, gtt. xx; Water, fl. ʒ iv. Mix. Sig.—One teaspoonful four times a day. Specific Thuja gives comfort in that unfortunate condition in old men with enlarged prostate in which the urine constantly dribbles, entailing much discomfort and misery, and producing unsightly stains upon the clothing. Whether it will reduce enlarged prostate has not been satisfactorily determined, but that it relieves weakness at the neck of the bladder is well established. It is especially useful in cystic irritability when associated with eczema or with gout. Specific Thuja is a remedy for atonic amenorrhœa when the genital tissues are flabby and lifeless.

Long's Thuja.—The value of Long's Thuja in the treatment of granular ophthalmia (trachoma) can not be overestimated. When the granules are soft and pultaceous we have had excellent results from lightly passing the wetted alum pencil over the everted lid, making but one sweep at each treatment. The parts are then dried, especially if the sub-conjunctival tissue is much infiltrated, and the ointment applied by means of a hair pencil. The parts should be thoroughly covered. The patient soon learns to apply it, and once a day the ointment may be used. At first a smarting pain is produced, which passes away in a short time. Absolute cleanliness must be insisted upon and constitutional treatment given when demanded.

Aqueous Thuja.—Few topical agents give as satisfactory and prompt results as this preparation. It may be employed in most of the conditions named under *Specific Thuja*, except where the intention is to produce irritation or inflammation, as in hydrocele. Internally it serves practically the same purpose as Specific Thuja and is devoid of alcohol. For use upon sensitive membranes it is to be preferred to alcoholic preparations. It may be used upon trachoma (less useful than Long's Thuja), excessive granulations, warts, granular urethritis, in nasal, vaginal, urethral, rectal and cystic catarrh, and combined with hamamelis is an excellent application for leucorrhœa. It gives prompt results in small nasal polypi, post nasal catarrh, and soft growths upon the Schneiderian membrane

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For acute gonorrhœa no combination excels the following: *R.* Aqueous Thuja, one part; Lloyd's Colorless Hydrastis, one part; Warm Water, four parts. *Mix.* *Sig.*—Inject every three hours. If there is much soreness Specific Hamamelis, one part, may be added. The same combination gives excellent results in acute and chronic proctitis, especially that following dysentery, and is one of the applications, either alone or as combined above, for balanitis and abrasions or excoriations of the glans penis. Its most prominent use is for the relief of moist pultaceous chancroids. It may be employed full strength or diluted. It quickly relieves the pain, checks the discharges and odor, prevents lymphatic involvement, and heals the parts rapidly. Its cleanliness, ease of application, and lack of unpleasant odor makes it a very desirable remedy for these purposes, as it is also for catarrhal granulation of the cervix uteri, commonly called ulceration of the cervix. If the womb is displaced it should be reduced and tampons, saturated with Aqueous Thuja, applied three times a day, a thorough hot douche preceding each application. The Hydrastis, Thuja and Hamamelis combination suggested above is often of better service.

Aqueous Thuja is an excellent remedy for chapped hands, fissured nipples, syphilitic psoriasis, and mucous patches of mouth and throat. Touching with silver nitrate will hasten its action in mucous patches. It may be used with confidence in palmar eczema (eczema fissum), in anal and vulvar pruritis, when associated with fissures, and in the dry furfuraceous forms of eczema. It has been advised for sore mouth due to ptyalism from mercury and iris—now rare conditions. Some prefer Aqueous Thuja for hypodermatic use. It will probably not equal Specific Thuja in warts, hydrocele, etc. In aphthous conditions Thuja is less useful than treatment directed to the digestive organs.

Thuja has been lauded as a remedy for malaria and for worms, but we have better agents for these conditions. The specific and the ointment have been reputed agents for the removal of tarsal tumors and cystic growths about the eye, while for pterygium, complicated with sclerotic and palpebral inflammation, it has received notice in homœopathic circles. In a case of our own it afforded temporary relief only, in a case of pterygium, the trouble promptly returning after withdrawal of the unguent. Full strength Specific Thuja, applied three or four times a day to rodent ulcer or lupus is accredited with a cure. This statement should be regarded with caution—probably mistaken diagnosis. It has been recommended for syphilitic psoriasis and nodules, taken internally and employed and internally for the relief of syphilitic rheumatism. The

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following cured a case of discharging urethral fistula in a man of 65, due to stricture from an old gonorrhœa. *R.* Specific Thuja, $\mathfrak{z}$ i; Asepsin, grs. x; Sulphate of Hydrastin, grs. x; Water, fl $\mathfrak{z}$ iv. Mix. Sig.—Inject a small syringe full after each micturition (C. B. Sargent). Use Specific Thuja, full strength upon cancrum oris and for ulcerated stomach. *R.* Specific Thuja, $\mathfrak{z}$ ii; Chloroform Water, $\mathfrak{z}$ iv. Mix. Sig.—One teaspoonful every three hours together with five grains of Bismuth Subnitrate every four hours (P. F. Bullington). Apply Long's Thuja to itching eczematous spots (John Fearn). It has been successful in some cases of goitre, applied externally (Howe) and relieves tender swellings at the nasal orifice; it also relieves fissure of the lips (Watkins). Specific and Aqueous Thuja have been advised "where the mouth feels sore as if it had been burnt." Together with proper hygienic observance nocturnal emissions are controlled by ten drop doses of Specific Thuja before meals and at bed time (J. P. Dice), and ten drop doses every two hours cured a severe deep-seated pain in the region of the clitoris following all-around orificial work. The pain came on during convalescence (Dice). Five to ten drops of Specific Thuja, in a 2-drachm bottle filled with No. 30 pellets, dose every two hours, will cure many cases of leucorrhœa in young girls (Dice). Eight cases of hernia were cured by injection of Specific Thuja in and around the hernial rings, working it in contact with all parts by invagination of the scrotum. One-half drachm was injected every twelve to fourteen days, compresses and elastic bandage applied, and the patients placed in a recumbent posture for a few days. Pain and swelling were produced, a cure following (J. C. Dwyer, Valentine, Nebraska).

Following will be found a few selections concerning Thuja in disease treatment, as contributed to current medical literature by physicians who use it. Also a few of the original articles of Professor A. J. Howe, to whom credit for the general introduction of Thuja is mainly due. (See note, pp. 10 and 11.)

Little Things about Thuja.—When a patient comes into the office with some rawness and slight excoriation upon the head of the penis and around the corona glandis, a dilute solution of Thuja is applied with a soft camel's hair brush; then aristol dusted on, and a small amount of vaseline used to cover the surface. This is all that is needed to effect a cure. When the patient returns in a day or two, the trouble has disappeared. Sometimes a patient will come with two or three small soft chancres, which are revealed upon the under surface of the foreskin when it is retracted. In this case the small brush is dipped in undiluted Thuja and applied to the sores, after which they are dressed with aristol and vaseline. Usually two or three applications are sufficient. But if the chancres are numerous and deep, Thuja does not do as well as something stronger, that will

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convert the sores into a traumatism, after which they will soon heal, with the application of aristol.

There was a lady in my care in whom the lower lip of the uterine cervix was prolonged, indurated, and of the gristly feel; in appearance it was whitish, and was well defined from surrounding tissues. I consulted some of my professional friends in regard to the matter, and the general opinion among them seemed to be that it should be excised, and that local treatment would do no good. But the patient objected to the operation, consequently I commenced making local applications of a mixture of $\frac{1}{2}$ Thuja and $\frac{2}{3}$ glycerine. An improvement was soon perceptible. The treatment was carried out twice weekly for three months, at the end of which time a normal condition was restored.

I use Thuja quite frequently in sore throat. Sometimes there is nothing more than an increased redness and congestion, and at others, ulceration of a superficial character. In these cases, a brush is dipped in Thuja more or less diluted, as the case demands, and applied to the surfaces. In some cases of superficial ulceration about the roof of the mouth, fauces and tongue, it is of value, but not in all. Sometimes silver nitrate or other preparation does better, especially in syphilitic sores. Thuja is of considerable use in those tender and painful swellings which appear in the nose, just inside the external meatus. In this case, also, the brush is dipped in dilute Thuja, and then applied to the painful spot three or four times a day. I have also found it a satisfactory remedy for warts, moles, and small growths, which occur on the hands, face, head, and other parts of the body. A few applications of undiluted Thuja causes them to shrivel, and finally disappear.

A lady of my acquaintance was troubled with a slight fissure in the center of the lower lip, which, as she was of a pleasant disposition and much given to smiling, caused her a great deal of discomfort, for laughing was painful. This fissure had obstinately resisted treatment, both medical and surgical, for a year. I gave her Thuja, and told her to apply it to the fissure occasionally through the

Professor L. J. Howe was born in Paxton, Massachusetts, April 25, 1825, his ancestors being of Revolutionary fame, and of New England extraction. He died in Cincinnati January 16, 1892, and is buried at Paxton, Massachusetts.

Professor Howe attended the Massachusetts district schools, and as a New England boy imbibed a love for Nature as well as of letters. He entered Harvard College in 1849, graduating in 1853, after which he studied medicine with Dr. F. H. Kelley, of Worcester, Massachusetts. But he said that six years previous to entering Harvard he had studied medicine in this same College, under Dr. Calvin Newton, whose death occurred before his literary course was completed. Professor Howe always regarded Dr. Kelley as his preceptor. The year of his graduation from Harvard, and until 1854, he attended lectures at the Jefferson College, in Philadelphia. The next year, 1854-5, he attended the New York City College of Physicians and Surgeons and the College of Medicine, frequenting the hospitals for clinical advantages.

Professor Howe's inclination leaned largely to Surgery and Anatomy, and he was immediately made an instructor in the school from which he graduated, and for a time during the absence of the Professor of Surgery, Dr. Burnham, in Massachusetts Senate, Professor Howe cared for his patients.

He next received a call from the Eclectic College of Medicine in Cincinnati, a rival at that time of the Eclectic Medical Institute. Upon the affiliation of the two, he was appointed Professor of Anatomy, and when Professor Freeman resigned, was elected to the vacancy in Surgery. This position he occupied with credit and conspicuity to the day of his death.

Professor Howe was a large, strong man, of commanding figure, and numbered among his close personal friends prominent physicians and surgeons of all branches of the profession. He was a man of great positive personal energy, determination and industry. He was very charitable to the poor, and ethical to a degree as concerned his co-laborers. He was a prolific writer on scientific subjects outside of surgery, an active member of the Cincinnati Society of Natural History, a member of the Association for the Advancement of Science, and of the Cuvier Society of Cincinnati, to all of which he contributed freely with his pen. He was President of the

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day. In a week or so the fissure was healed, and has remained so ever since, now six or eight months.

I have not attempted to make a formal presentation of the subject of Thuja, but simply to relate my every-day experience. No doubt many others have used the remedy in ways which I have not seen. I keep the remedy by me constantly and indeed would be at a loss sometimes without it.—*Lyman Watkins, M. D., in Eclectic Medical Journal.*

Thuja Occidentalis.—An eminent physician once said: "When I began the practice of medicine I had many remedies for each disease after many years experience, I had but one remedy for many diseases."

The one remedy I find most useful for the many diseases is the one at the head of this article. It is not a new remedy, for the record of its use extends over a period of two hundred years. To our Homœopathic and Eclectic brethren are we indebted for much we know of its virtue. Their experiments have proven it to be slightly anodyne, stimulant, antiseptic, alterative, astringent and tonic, having its principal action on skin, mucous membranes and generative organs.

From the above statement we see that Thuja will be useful in many cutaneous affections, particularly in eczema—more especially in the dry variety. In pruritis, whether anal or vulvar, when accompanied by fissures of the skin, it will be found useful and curative. In epithelioma of the face, in warts, tumors and excrescences you will not be disappointed. For chapped hands, so troublesome in the fall of the year; in all mucous patches or ulcerations of the throat, whether syphilitic or diphtheritic; in pyalism from mercury or iris, Thuja will be found valuable.

In nasal, vaginal, rectal, urethral or bladder irritations and vesiculitis, Thuja should be thought of. In hydrocele it is safer and surer than carbolic acid and iodine.

In trachoma and conjunctivitis it will remove the granulations and subdue the inflammation.

National Eclectic Medical Association in 1882. From 1859 to the time of his death, Professor Howe wrote profusely for the Eclectic Medical Journal, and frequently for other journals. As an author he published the following in volumes: *The Art and Science of Surgery*; *A Treatise on Fractures and Dislocations*; *A Manual of Eye Surgery*; and *Operative Gynecology*.

In 1853 Dr. Howe married Miss Georgiana Lakin, of Paxton, who, after his death, published a volume of his manuscripts titled: "*Miscellaneous Papers by Andrew Jackson Howe*," and later a book for the young that he left in manuscript, "*Conversations on Animal Life*."

As a surgeon Dr. Howe was bold, quick and careful, fearless and yet kind. He was combative, dogmatic some might say, but never inclined to bitterness. He contended for principles, and nursed no painful recollections concerning an opponent, and fostered no self-made suspicions to be nursed and magnified concerning a friend.

As a therapist, Professor Howe was a man of few remedies, but these few were to him most important. He had a pride in certain preparations, and probably few men in medicine with an extended list of agents have left as many that live, increasingly in use, as those established by Professor Howe. Aqueous *Pinus Canadensis* was one of his introduced remedies thirty years ago and he wrote its praises freely. Following this came Howe's Juniper Pomade, Acid Solution of Iron, Viburnum Cordial, Escatol, Thuja (the subject of this Drug Treatise), and Dynamine. "These preparations" he said, "will go down to posterity, for they have been proven," and his words seem to have been prophetic.

Professor Howe in the very prime of his apparent strength was attacked by a carbuncle, and as strange as it may seem, fought against the very surgical methods he had himself employed so successfully all his life. He only acquiesced in the demands of his attendants, Drs. Russell and Spencer, when, too late, his energies were exhausted.

I knew Howe well. He was a great man, a great surgeon, and deserves all that is said and thought of him by the friends he has left.

A longer biography of Professor Howe can be found in the Eclectic Medical Journal, Cincinnati, Ohio, 1892, and *Felter's History of the Eclectic Medical Institute*.

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Oftentimes a patient presents himself with balanitis or abrasions or excoriations on the head of the penis, or around the corona glandis. A few applications of Thuja will greatly relieve him and please you.

In soft chancres, when not too deep, a wash or ointment of Thuja will be sufficient. In catarrhal ulceration of the uterine neck a tampon of Thuja and glycerin will rapidly cure. Given internally in proper doses, it arrests passive hemorrhages. It will cure enuresis of children and check the dribbling of the aged when not of parietic origin. It is the remedy in vesical irritation—especially in aged women. In amenorrhœa, from pelvic atony, it must not be forgotten. In anal fissures and prolapsed rectum of children, either applied locally or used with the hypodermic syringe, a cure may be anticipated. Combined with chloroform and menthol it forms an efficient styptic for bleeding gums and hemorrhage after extracting teeth.

Thuja, in combination with hamamelis and hydrastis used as a rectal injection in acute and chronic proctitis, will not disappoint you. With nux vomica added you have almost a specific in those atonic conditions so often met with following dysentery. In these cases Thuja seems to act in a double capacity. By its astringent and anodyne powers it soothes the irritation and contracts the dilated blood vessels in the inflammatory stages, by its stimulating and tonic properties it restores vigor and gives vitality to the atrophic conditions.

In urethral caruncles a properly diluted solution applied with absorbent cotton or painted on with a camel's hair brush, will cause their disappearance without pain, the knife or danger of hemorrhage, much to the relief of the patient and the satisfaction of the practitioner.

In syphilitic psoriasis and nodules, Thuja combined with iris versicolor given internally is the equal of mercury and iodide of potash. In all diseases of bad blood, with warty excrescences or ulcerations showing prominence of papillæ, either of cutaneous or mucous surfaces, Thuja can be relied on. It has been recommended in malaria, rheumatism and for worms. I have had no experience with it in these cases.

In leucorrhœa and gonorrhœa and all discharges of mucous surfaces, Thuja should be thought of. To obtain the full benefits of its use, much depends on the mode of its administration, and more on the preparation used. For internal administration it should be given in small doses frequently repeated, and its effects closely watched.

In vesical irritation, in large doses, it will increase rather than diminish the trouble. As a local application it can be used diluted one to four parts, or one to two, or equal parts. In chancroids and ulcers I frequently use it in full strength. The fluid and solid extracts I find of unequal strength and unsatisfactory.

I keep it always in my case and find more use for it than for any other one remedy.—*D. G. Himrod, M.D., in the Daily Lancet, Philadelphia.*

Thuja Occidentalis in Trachoma.—Some unpleasant complications are to be expected from all alcoholic preparations when brought in contact with conjunctival surfaces. Such has been my experience during the past two years while giving this remedy a thorough trial in this formidable malady. In view of something better, which Prof. Lloyd is ever ready and able to produce, a non-alcoholic extract, made from fresh arbor vitæ, was received at my office for trial. It is an elegant extract, carrying the consistency of honey drip, compatible with lard or vaseline, and can be applied to exuberant sago-like bodies, either acute or chronic, in full strength, or dilute, as may be required in each individual case.

A sensation of warmth and slight stinging is experienced when first applied, especially in acute trachoma, which subsides in a few seconds.

THUJA.

The mode of application must vary with each individual case. I have, with a camel's-hair brush, painted the spawn-like conjunctiva with full strength extract with gratifying results. When the sub-conjunctival tissue is greatly infiltrated, or the granulation exuberant, the lid should be everted over the tip of the index finger, and held in that position, removing the secretions until the surface is dry, then apply with a brush:

R. Thuja, non-alcoholic, Lloyd's,* - - - - 3 i.
Vaseline, - - - - - 3 iii.

M. Rub thoroughly, until the entire granular surface is imbued with the unguent. The lid is then returned and its fellow treated likewise; after which the eye is kept closed for five or ten minutes, when the patient can return to his vocation, to be re-treated once a day. For children a weaker mixture should be used.

R. Thuja, - - - - - gr. xx.
Vaseline - - - - - 3 ij.

Constitutional treatment when demanded and cleanliness should be enforced.

—D. Thos. Long, M. D., *The Medical Gleaner*.

Howe's Thuja or Specific Thuja.—The average druggist, when he gets a prescription calling for tincture of Thuja, will take a fluid extract and reduce it with alcohol till it is thought to represent a tincture of the medicine; but it is not what is designed or expected by the writer of the prescription. Howe's tincture is meant, and it contains many times as much medicine as that made from the common tincture. If the article made from a fluid extract be employed to inject a hydrocele it would make the patient scream with pain.

If the writer of a prescription would indicate Howe's tincture, and the apothecary put up a common article, made from fluid extract, there would be cause for action. The ordinary stuff will not cure a syphilitic throat and ulcerative states generally, and I think it would fail to cure hydrocele.—*Editorial Eclectic Medical Journal, 1891.* (Dr. Howe used Specific Thuja, but as he introduced it to the profession, often called it "Howe's Thuja," see pages 2 and 3.)

The Specific Indications for Thuja.—By indications I understand experimental evidence that a certain drug, Thuja for instance, will impress the diseased organism for the better, as manifested through symptoms. I have ascertained empirically or experimentally that Thuja, in appreciable doses, will act as an antiseptic upon diphtheritic states of the mouth, nose, and the throat, in stomatitis for instance. The medicine never aggravates diphtheria and always improves curable cases. Thuja always imparts a curative action to syphilitic ulceration of the mouth, fauces, and nasal passages. Thuja lessens the vascularity in *navus maternus*, or "mother's mark," if applied frequently. Thuja thrown into the *tunica vaginalis testis*, after the serum of hydrocele has been evacuated, cures the disease. Thuja administered as an internal medicine will arrest passive hemorrhages by causing the vascular capillaries to contract. Thuja restrains enuresis, both the bed-wetting of children and the dribbling of the aged, unless paresis exists. Thuja in two or three drop doses reduces the swelling of prostatitis and has reduced the size of hypertrophied prostates. In the morbid states enumerated, and kindred disorders, Thuja is specifically indicated according to my testings. Several medical practitioners of my acquaintance have verified my own statements. Tentative work on the therapeutics of Thuja has been earnestly pursued for eight years. Nothing but experimentation and careful discrimination can constitute a reliable

*This is now (see pp. 3 and 7) known as Long's Thuja.

THUJA.

Indication. Speculation should not count. The curative powers of Thuja in hydrocele have been tried in sixty cases in my own practice and without a failure to result in riddance of the disease. I considered that the drug was specifically indicated when I had cured four consecutive cases, though continued success made the indications more pronounced. If two had proved successes and two failures, the indications would have been doubtful; if three had turned out well and one failed, the remedy would have been indicated; if three had been failures and one a success, the forecast would have been against the agent, for other remedies have effected cures in a greater proportion of trials.—*A. J. Howe, M. D., Editorial Eclectic Medical Journal, Cincinnati, O.*

More About Thuja.—Within two months I have been solicited to treat goitre. The patients are women, and the deformity and inconvenience only moderate. I prescribed Specific Thuja as a local remedy, the fluid to be applied daily, at night; and in both instances there has been a satisfactory reduction in the size of the tumors, and a relief to the sense of constriction felt in the neck. The medicine does not discolor the skin.

A few weeks ago I wrenched masses of polypoid matter from a nasal cavity; and knowing that portions of the morbid structure were left untouched, I ordered daily injections of Thuja, a piston syringe being the implement advised as a medium to force the fluid into the nasal chambers. The traumatic surfaces have now healed, and the lacerated remains of the polypus are fast disappearing.

The good work the remedy has done in establishing activity in tumors, encourages a more extended range for the uses of the medicinal agent. I shall try the remedy on warts the next time an opportunity to do so may present itself.—*A. J. Howe, M. D., Editorial Eclectic Medical Journal, Cincinnati, O.*

Thuja in Hydrocele.—Although I have published the method of employing Thuja in the treatment of hydrocele, I am still requested almost every day to tell a correspondent just how to execute the plan, what strength to employ, etc.

Well, here it is again: In an ounce of warm water pour an ounce of Specific Thuja. Mix by drawing up a quantity in a syringe, and forcing it back with the descent of the piston. Then draw up about two drachms of the dilute mixture in the barrel of the syringe, to be ready for use. Send a large exploring needle into the sac of the tunica vaginalis testis, and let the fluid escape. Now, before withdrawing the needle, place the nozzle of the loaded syringe into the needle's open mouth, and with a plunge of the syringe's piston send the diluted Thuja into the cavity recently distended with serum. Then to make the liquid enter every crevice in the sac of the hydrocele, the fingers should pinch and knead the scrotum quite vigorously. The hollow needle is then withdrawn, and the provoked pain is considerable for a half hour or so. The patient then goes about his business, and no additional treatment is required. For a day or two there is some swelling of the scrotum, making it appear that there has been a re-accumulation of serum, yet this passes off in a week, and the disease is radically cured.—*Editorial Eclectic Medical Journal, A. J. Howe, M. D.*

Thuja in Hydrocele.—Dr. George W. Irick, of 49 N. Illinois Street, Indianapolis, Ind., writes us that after repeated failure from other remedies, he injected into a case of hydrocele equal parts of Specific Thuja and water. This case was an extremely severe one and in a patient 68 years old. To the surprise of everybody, the recovery was complete. The Thuja has full credit. The patient is now better than for years before.—*From the Eclectic Medical Gleaner.*

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Thuja in Hernia.—Dr. J. C. Dwyer, of Valentine, Neb., writes that he has cured eight cases of hernia and greatly relieved three others, by injections of Specific Thuja in and around the hernial rings, working it into contact with all parts of the canal by invaginating the scrotum upon the end of finger, etc., etc. He injects one-half drachm every twelve to fourteen days, then applies a compress and elastic bandage, keeps the patient in the recumbent position as much as possible for a few days. There is some soreness or swelling for several days, but the Doctor has never observed *bad* results from its use. He is sure to use a clean syringe, etc. He believes the remedy is devoid of danger.—*Eclectic Medical Gleaner*.

Thuja for Anal Prolapsion.—Children and elderly persons are somewhat liable to protrusion of the anal folds during defecation. The defect hinges upon paresis of the fundament—partial paralysis of the defecatory apparatus. Locally stramonium may be employed to advantage, and so may hamamelis, but *Thuja* is specifically a topical restorative. It may be injected hypodermically, or applied as a lotion, reduced or diluted with water. It may be compounded with stramonium, hamamelis, and glycerine, the combination proving curative or restorative. A small quantity of the mixture may be injected within the anal apparatus or utilized as a suppository. *Thuja* is an excellent remedy to be applied in "orificial surgery;" it stimulates the sphincters and favorably impresses "post-rectal ulcers." *Thuja* blows both hot and cold, it will impart tone to relaxed sphincters, and relax a rigid grip. The agent operates salutarily upon hemorrhoids, and restrains the dribbling of vesical incontinence. No "orificial surgeon" should be without the information here imparted. It will contribute pucker to the lips of a whistler, and prevent the involuntary discharge of flatus.—*Editorial Eclectic Medical Journal*. A. J. Howe. M. D.

Thuja Occidentalis in Affections of the Eye. *Arbor vitæ* or *Thuja* is one of our most valuable remedies. It will cure lupus or rodent ulcer by applying the pure tincture to the diseased structure three or four times a day. A little smarting is at first experienced, which soon passes off. Excrescences of the skin will melt away under daily applications of the remedy. Its influence upon cystic growths, involving mucous membranes about the eye, has a most pronounced effect for good.

Trachoma yields promptly under the daily use of the non-alcoholic extract. In some cases it may be diluted with water one-half. But the most pronounced benefit I have observed from its use in affections of the eye is in that of pterygium, complicated with sclerotic and palpebral conjunctivitis.

A young man who had been working in the dust was overcome and prostrated and brought home, when I was summoned to see him; found profound and severe headache, pain in the eyes; ordered hot pediluvia, warm bath to head and eyes, with indicated sedatives, and rest in recumbent attitude. In two or three days he was all right, except sore eyes with the pterygium. Prescribed equal parts of water and *Thuja*, and in a few days the conjunctivitis had entirely disappeared, and the daily application of the above mixture to the pterygia (for both eyes were affected with them) for a month; they have both disappeared and are well.—*The Homœopathic News*.

Long's Thuja.—An extract to be used in the eye, alcohol being objectionable. Dr. D. Thomas Long, Topeka, Kansas, desired a preparation of the consistency of a cerate, embodying all the properties of the preparation of *Thuja*, in a form that could be mixed with vaseline. This is called Long's *Thuja*. It is of the consistence of a cerate, and will mix smoothly and evenly, with either vaseline,

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lard, cerate or oil, and is designed specially for unctuous preparation to be used in the eye; price 25 cents per ounce.—*The Eclectic Medical Gleaner.*

Specific Usages and Indications of Thuja.

Chancroid; verrucous growths of soft character and foul odor; enuresis of children; urinal dribbling of the aged; vesical irritation and atony; urine easily expelled upon coughing, sneezing, or muscular exertion.

Dosages.

Oil of Thuja.—1 to 3 drops on sugar or in emulsion.

Specific Thuja.—1 to 20 drops.

Aqueous Thuja.—1 to 30 drops.

Long's Thuja.—Full strength to $\frac{1}{8}$ strength.

Aqueous Thuja and Specific Thuja may be employed full strength or diluted according to purpose to be accomplished.

PRICES OF THUJA PREPARATIONS.

Specific Medicine Thuja.	$\frac{1}{4}$ -lb. Package,	60c each.	By mail, 82c each.
	$\frac{1}{2}$ -lb. "	\$1.15 "	Not mailable.
	1-lb. "	2.25 "	Not mailable.
Felter's (Aqueous) Thuja	1-oz.	20c "	By mail, 29c each.
	$\frac{1}{4}$ -lb.	65c "	By mail, 87c each.
	$\frac{1}{2}$ -lb.	\$1.25 "	Not mailable.
	1-lb.	2.50 "	Not mailable.
Long's Thuja	1-oz.	25c "	By mail, 34c each.
	$\frac{1}{4}$ -lb.	90c "	By mail, \$1.12 each.
	$\frac{1}{2}$ -lb.	\$1.75 "	Not mailable.
	1-lb.	3.50 "	Not mailable.
Thuja Ointment.	1-oz.	15c "	By mail, 24c each.
	$\frac{1}{4}$ -lb.	35c "	By mail, 50c each.
	$\frac{1}{2}$ -lb.	65c "	Not mailable.
	1-lb.	\$1.20 "	Not mailable.
Oil of Thuja.	1-oz.	60c "	By mail, 69c each.

For sale by Pharmacists generally and by all Wholesale
Druggists of America.

MAY, 1904.

LLOYD BROTHERS, Cincinnati, Ohio.

A TREATISE

ON

Cactus Grandiflorus.

The Therapeutic Uses are written for this Treatise by Professor FINLEY ELLINGWOOD, M. D., Chicago, Ill., editor of Ellingwood's Therapeutist, and author of "A Synopsis of Medical Chemistry," "Manual of Urinalysis," "Materia Medica, Therapeutics and Pharmacognosy," "Eclectic Treatment of Disease," etc.

The reproductions are by J. MILTON SANDERS, M. D., from the Transactions of the New York State Medical Society, 1876. and P. WATSON WILLIAMS, M. D., London, England, from The Practitioner, Vol. XLVII.

The Specific Uses and Indications are from the writings of Professor J. M. SCUDDER, M. D.

The Description, History, Chemistry and Pharmaceutical record are by JOHN URI LLOYD.

Treatise No. 1 embraces Thuja Occidentalis and Cratægus.

Treatise No. 2 embraces Cactus Grandiflorus.

Treatise No. 3 will embrace Pilocarpus (Jaborandi).

Drug Treatise, Number II.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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Cactus Grandiflorus.

(CEREUS GRANDIFLORUS—Cactus)

This plant, known under the common names Large-flowered Cactus, Sweet Scented Cactus, Vanilla Cactus, Queen of a Single Night, is, however, most familiar under the name Night-Blooming



No. 1—CACTUS GRANDIFLORUS.

Photographed by Mr. Thomas Bell, Cincinnati. Flowers were from 10 to 12 inches in diameter.

Cereus. It is a green stemmed climber, indigenous to Jamaica and possibly elsewhere in the West Indies. It is abundant in some parts of *Mexico, and when protected from frost, to which it is very sensitive, is cultivated in temperate regions, where its magnificent flower, from 8 to 10 inches in diameter (Fig. 1), opening after sundown and decaying next morning, is an object of interest and delight. It has long been known to botanists, but the first general introduction of the name to the public, about the middle of the last century,

was as a trade-mark or fanciful application for a popular perfume. It is needless to state that the only connection of the trade-perfume and this flower is that of name. Both the young and the tender stems of the plant, and the flower, are used in medicine, the flowers being tintured immediately on opening, the stem being worked fresh. From a letter written us from Mexico by a man who has for 12 years made a specialty of Cactus we extract as follows concerning the flowers:

"My experience is that the blossoms in a wild state are not so fragrant as when cultivated, possibly because the aroma is confined in a closed room. The perfume differs owing to time of year, variation and moisture, rapidity of bud development, etc. I have ridden through canyons laden with flower blooms where the odor was heavy; again on mountain sides I have scarcely noticed it."

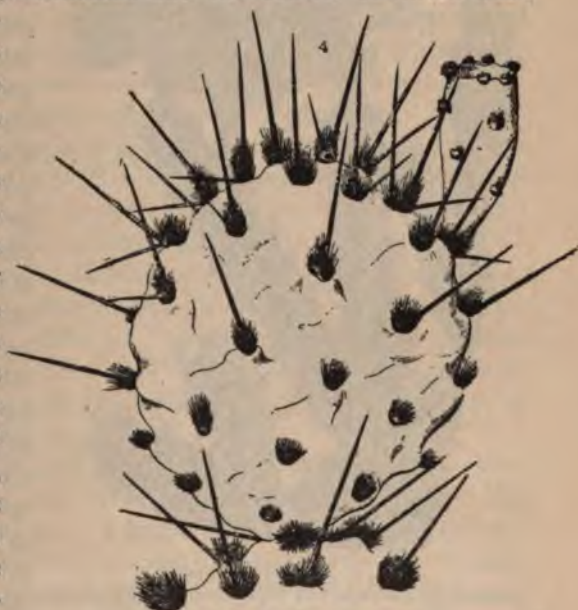
* Englemann does not cite Cactus Grandiflorus as native to Texas or the Southern United States. Dr. Louis Caparelli writes us that he has never seen it growing near Aguascalientes, Mex.

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odor. The flowers differ in color, according to soil and surroundings, those climbing trees being often markedly in contrast to the blossoms of mountain plants. I have concluded that flowers taken from such localities might be considered by some as being from distinct varieties of Cactus."

Much needless confusion has existed among collectors of the drug (excluding even the variety *Bonplandi*), and many different species and varieties of Cactus have been inexcusably substituted for it in medicine. Chief among these sophistications is *Opuntia Rafinesquii* of Kentucky, Tennessee and the central southern west (see Fig. 2), and the com-

mon species and varieties of Cactus peculiar to the western and southwestern deserts. Cactus *Grandiflorus* is so conspicuous and its characters are so marked as to prevent most substitutions other than by intent or extreme ignorance, although we have seen substitutions of the stems of species somewhat resembling it from the far southwest, which may possibly have been offered in good faith (see Fig. 3). The stem is variable as concerns its angles, the same plant sometimes carrying



No. 2—*OPUNTIA RAFINESQUII*.
Reduced from plate XI Trelease and Gray's edition of
George Engelmann's Botanical Works.

branches bearing from to 4 to 8 angles. For example, we have known a 5-angled stem sprouted in sand to change at the base to 4 angles. The variety known as *Cereus Bonplandi* is said to possess the qualities of the *Grandiflorus*, but our experience leads to the use of the typical species only. Indeed, the so-called "Bonplandi" as offered in commerce is often a variety of the *Grandiflorus*, so near as to even puzzle a botanist. For this reason mainly and also because it is but a variety of the *Grandiflorus* we have ceased to list *Cereus Bonplandi* or to concern ourselves over its relationship.

We prefer to use for our preparations the open air plant collected in a sun heated part of the tropics, where frost does not occur, rather than that raised in the greenhouse, and we believe that the long and extensive use of our preparations by physicians fortifies

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our conclusion, which is based on much experience concerning the quality of the tropical grown open-air plant.

In this connection, we will state that because differentiating chemical tests are altogether wanting, at present no possible method



No. 3—*CEREUS PROCUMBENS*.

Reduced from plate LIX Trelease and Gray's edition
of George Engelmann's Botanical Works.

species were available by the ton at comparatively little cost.

Constituents:—*Cactus Grandiflorus* is mucilaginous, and yields a sticky juice. The green stems form a viscid pulp when pounded in a mortar. Its qualities are of a resinous nature, and are abstracted by alcohol. No water is admissible. Its active constituents have not been determined other than that they are related to the resinous substance. The inorganic constituent is Oxalate of Calcium and the acid is tartaric acid (Kunzé).

Medical History:*—*Cactus Grandiflorus* is said to be used by the natives of its habitat (Jamaica) for fevers, difficulty of breath-

* Parties interested in Cactus may find the most conspicuous studies of the drug as follows: A monograph by Dr. Rocco Rubini, Naples, 1864, *L'Art Médica*. Vol. XX. Translated for *British Journal of Homœopathy*, 1864, with clinical note by Dr. J. R. Russell. Pamphlet translation of same by Dr. Ad. Lippe, 1865. An admirable study of many species and varieties, Dr. Richard E. Kunzé, New York City (now of Phoenix, Arizona), *Trans. E. M. Society*, N. Y., 1875-76. A review of the literature and a pessimistic study of the drug by Dr. Gordon Sharp in "*The Practitioner*," 1894. All the Eclectic and Homœopathic works on *Materia Medica* and *Therapeutics* since 1870.

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ing and many other affections. It is also employed in Mexico for like purposes. Possibly its reputed virtues in the direction of the respiratory organs led to its consideration as a heart remedy, the first record of its use being by the German Dr. Scheele, whose research, however, passed practically unnoticed until Dr. R. Rubini, a Homœopathic physician of Naples, brought the drug into conspicuity as a heart remedy. *Cactus Grandiflorus* or "Cactus" is thus a remedial agent of Homœopathic introduction, in which school it was exclusively employed for many years. When Dr. J. M. Scudder issued "Specific Medication," 1870, he accorded to Cactus an important place. Under his favor its reputation extended so that all Eclectic authorities became familiar with its virtues and commended it without reserve. The most comprehensive and complete early study of the Cacti family in medicine is that of Dr. Richard E. Kunzé in the Transactions of the New York Eclectic Medical Society, 1875 and 1876. From this we present important excerpts and also abstract the record of its use in the case of Prof. J. Milton Sanders, M. D. Chemist, New York College. Innumerable journal contributions as well as all the books on materia medica issued in the Eclectic school have contributed to the praise of Cactus. Indeed, it is evident that in America credit for the bulk of Cactus now used outside Homœopathy is due either to the influence of Eclectics direct or to their professional affiliations.

Qualities:—Bruised green Cactus has a strong, herby odor, an incipid sourish taste, and is mucilaginous to the touch. Its fresh juice turns blue litmus to a bright red, the sliced plant floats on water to which the dissolved mucilage imparts acidity such as to make it capable of effervescing with carbonated alkalies. The stem shrinks to a fragment, losing 19-20 in drying. The sliced stem, exclusive of its water, imparts but little weight to alcohol (10.6728 gm. left residue 0.47 gm), which menstrum, however, abstracts all the color. To water the sliced stem imparts its mucilage, losing much of its weight, but not its color.

Like *Cratægus* (See Drug Study No. XI), Cactus is not to be classed with poisons, and yet, if given in excessive amount it has been recorded that it may act as an irritant, producing diarrhœa and other unpleasant symptoms. Unlike *Digitalis* it is not cumulative in action and in proper dose can be administered for months without disturbing digestion.

PHARMACEUTICAL PREPARATIONS.

Homœopathic pharmacopœias direct a tincture of the fresh plant. Scudder first used a tincture made, 4 ounces of the fresh stems to a pint of the tincture, but in his practice he soon replaced this

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rather weak preparation by the concentrated Specific Medicine, which, in our opinion, is the typical and most valuable preparation of the drug. We, therefore, offer under our label, only the Specific Medicine "Cactus" and the tincture of Cactus flowers. The first carries in itself the virtues of as near 16 Troy ounces of the fresh stems to each pint as we can produce in a uniformly permanent form; the latter being a tincture made by covering with pure alcohol the fresh flowers pressed into small compass. In both cases, owing to the moisture in the drug, only the strongest and the purest alcohol is admissible. By proper manipulation it is possible to make each minim of Specific Medicine carry the full medicinal virtues of one grain of the fresh green drug.

Specific Medicine Cactus has a green color, which by time and light sometimes changes to brownish, this change making no perceptible difference in medicinal effect. Its odor is that of alcohol only; its taste, herby. When dropped into water no precipitation results. Heat should not be applied to this preparation, and all attempts to carry its full value into a dry form, such as pill, powder or tablet, have resulted in failures. The residue from evaporation of Specific Medicine Cactus is distinctly acid even to the taste. This residue dissolved in water yields a reaction for glucose and the faintest trace of alkaloid, but has little therapeutic value.

Tincture of Cactus Flowers is of a very light green color, but is not in the least fragrant, its odor and taste being scarcely different from that of alcohol. The fact that even in the most concentrated form no evidence of perfume is present indicates that the term "Extract of Night Blooming Cereus" for a perfume is fanciful only. Tincture of Cactus Flowers is used in the same doses and for the same purposes as the stem preparation, and has no established superiority.

THERAPEUTICS OF CACTUS GRANDIFLORUS.

By FINLEY ELLINGWOOD, M. D., Chicago, Ill.

Therapeutically considered, we have in Cactus a heart remedy which possesses at once a directness, and yet a diversity, of action which places it in the minds of those who have used it for a long time at the head of the class known as special heart remedies.

Much discredit has been brought on this most valuable remedy by the use of improperly prepared preparations of Cactus Grandiflorus, and by the substitution of preparations made from less expensive inert species of the Cactus family. It is of the utmost impor-

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tance in prescribing Cactus, that the medicine which is used has been prepared from carefully selected specimens of the *Cactus Grandiflorus* only, and that in its preparation it has been worked pharmaceutically, under those exact conditions which long experience and the most practical observation have proven to be necessary, in order to obtain the full medicinal properties of the plant.

The dose of Specific Medicine Cactus has usually been from the fraction of a drop to two drops, and seldom exceeds five minims. While the agent is not classed as a poisonous remedy, there seems to be a prevailing opinion that it can be given in overdoses. I have never seen any unpleasant effects from overdoses, and I am growing into the belief that we will yet learn that there are cases where we now obtain indifferent results, or where the agent is not now advised, in which good results will be secured by much larger dosage than is now given.

Those who have used all the heart remedies unite in the belief that for breadth of action, for specific directness, for reliability and smoothness of action, and general trustworthiness when indicated, Cactus takes preference over others. Its influence is admirable, and it is invaluable in many cases. Other remedies in some cases will do as much in single lines, but none will do more, and none will exercise all of its desirable influences—will exercise so wide an influence.

In the determination of the physiological action of this remedy laboratory experiments and observations have been of but little value. The results have been negative in many cases, have been widely misleading, and have led noted observers and those of excellent authority in such observations to declare that the remedy is inert, and to draw other false conclusions and make erroneous statements concerning its action. Cactus is one of the non-poisonous remedies, regarding which the only reliable course to depend upon in drawing final conclusions is, careful clinical observations, repeatedly made and confirmed by different observers, under similar circumstances, or in cases presenting similar symptoms.

It is well to know, however, that the clinical observation of the remedy shows that in its physiological action Cactus acts upon the cardiac plexus of the sympathetic nervous system, regulating the functional activity of the heart, through its influence in regulating the action and restoring normal tone to the nervous system. At the same time the muscular structure of the heart is built up and improved, and many observers have noticed the entire progressive removal of valvular murmurs, from its influence.

It increases the musculo-motor energy of the heart, elevating

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arterial tension, increasing the height and force of the pulse wave. The agent becomes at once the heart tonic, *par excellence*, as it directly and with much positiveness improves the nutrition of the heart, strengthening the muscular power and improving the condition of the valves.

It produces no irritation of the heart muscle as does strophanthus, nor in proper doses does it produce gastric irritation or a cumulative influence as digitalis does. It increases the contractile power and energy of the heart muscle through the cardiac ganglia and accelerator nerves.

I desire to call particular attention to the tonic, restorative, and nutritional influence of Cactus. This influence is not immediate or plainly apparent on the nervous system, or on the system at large. But the strengthening influence of the agent on the action of the heart occurs very soon, and this is sustained, while the improvement of the function of the system, and through it of the functional organs, may be plainly observed to increase steadily and also permanently.

As stated, the symptoms are our dependence in prescribing Cactus. An irregular pulse; feebleness of the heart's action; dyspnea; weight; oppression in the chest; violence of the heart's action depending upon atonicity or enervation; these are the main symptoms. Wherever there is less than normal power to the heart's action—deficiency, due either to a fault of the heart direct, or to lack of power in the nervous system—this agent is indicated.

The especial symptom of a cord or band, or a grip about the chest, or around the heart, or around the body, is mentioned by most writers as a reliable indication for this remedy. In my observation, while Cactus is indicated where this symptom is present, it must by no means be discarded where the symptom is not present. When pain accompanies this symptom it is usually not a steady, dull sensation, but a lightning like, or sharp, acute, or shooting pain, accompanied with a sensation of suffocation, difficult breathing, faintness, cold perspiration, and fear of impending danger.

Where from any cause there is an exaggeration of the power of the heart, or a temporary undue increase of nerve force, influencing the heart, causing an exalted condition of the heart's action, the remedy is contra-indicated, and this fact must be kept in mind.

My personal conclusions concerning the action of this remedy are based upon observations made almost continuously over a period of thirty-two years, and I believe they may be said to be fairly reliable. I came to the conclusion a number of years ago, that where rectly indicated, during the course of asthenic fever, the agent had ial sedative influence. My subsequent experience and that of

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others has confirmed that conclusion. While usually given where there is no fever, it must be given for its indications, whatever the temperature.

Excellent homeopathic authorities have made the observation that it is almost a counterpart of aconite, in its influence on fever, differing from that agent, in that it increases the strength and tone of the heart's action by increasing the nerve power, instead of paralyzing the nerves. It is thus indicated in fevers, where there is a rapid and feeble pulse, from feeble heart, with a weak and exhausted nervous system. It would therefore be contra-indicated in the early sthenic stage of these fevers, where there is an exalted action. I have had reports of an increase of the temperature and an exaggeration of the symptoms when given in sthenic cases, especially in the early stage of typhoid.

A number of our prominent writers claim that the remedy is indicated solely for functional heart disorder. It is certainly our best remedy for this class of disorders. When from any reflex cause, with deficient heart action, there is irregularity, irritability, intermittency, and tumultuousness in its action, Cactus is indicated. It is especially valuable in palpitation or other irregularity of action, which is induced by irritation from derangement of the stomach, or of the intestinal tract, because it exercises a soothing influence upon the stomach and digestive organs, in marked contra-distinction to the action of digitalis, which disturbs, disarranges, or irritates the stomach, especially when long continued.*

In addition to its influence in functional disorders, I have found Cactus of much value where the heart muscle is more permanently enfeebled, and where there is progressive valvular insufficiency with dilatation, with irregular or intermittent pulse. I have given it where mitral regurgitation was plainly marked, and have noticed the progressive disappearance of the valvular sounds, with increasing tone, of the heart muscle until the sounds have entirely disappeared. Simple valvular murmurs during the course of an attack of hysteria, or during the early stages of neurasthenia, will quite promptly disappear from its influence.

A foreign writer who has been making some recent observations of the remedy in large doses, gives as much as thirty minims of the tincture three times daily. With this dose he has treated aortic lesions with faulty compensation. He has noticed cardiac dilatation to plainly recede under this large dosage. He has successfully treated

* For a comparison of the action of Cactus, in all its influences, with other well-known heart remedies, the reader is referred to the table on page 16 of this pamphlet, which I prepared for and published in the February, 1907, issue of *Ellingwood's Therapeutist*, page 51.

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with this remedy patients suffering from dyspnea, arrhythmia, edema of the extremities and ascites.

In angina pectoris, especially of recent origin, the remedy exercises a direct influence. I have given it in endocarditis, which followed other diseases, and I am sure we have no more dependable remedy. I am confident that there are many cases of pericarditis in which it will be found valuable. In one marked case of endocarditis following measles, the result of the influence of this remedy within a few hours was so plainly apparent that it could by no means be mistaken, and the influence was a permanent one.

In the treatment of functional disorders, as well also as the organic changes in the hearts of young men from the use of cigarettes or tobacco, this agent is in every way reliable. It exercises a steady, permanent influence, and will cure many cases as I have proven in my own experience, provided the habit is discontinued. It is also to be depended upon not only in overcoming the heart faults of masturbators, but in materially improving the nervous tone of these patients, and in correcting the sexual faults.

Through its influence upon the nerve centers it strengthens and adds increased tone to the sexual apparatus, soothing irritation and overcoming functional disorders and impotency, especially if used in conjunction with other directly indicated sexual tonics. Of its influence on the sexual and reproductive organs of women, I will speak later. Heart weakness, induced by excessive athletics and by bicycle riding, which is not now as common as during the early history of bicycles, is immediately met with Cactus.

A number of writers have mentioned the favorable influence of this remedy in the treatment of Graves' Disease. Its influence upon the heart is certainly a good one. It relieves the palpitation and nervousness, and controls the tumultuous and irregular heart action. I believe the dose should be increased in these cases until a full maximum quantity is given. It has been found a serviceable remedy where from the violent heart action, that distressing throbbing of the carotids is so troublesome a symptom. Its restorative influence on the nervous system contributes to the beneficial effects produced. I shall prescribe it with *Phytolacca* and *Echinacea* in my next case of this character, and shall push the dosage of each remedy, if no unpleasant symptoms occur, to the extreme limit.

A case is reported where there was a loud, double, aortic bruit, with enormous hypertrophy. It had been under observation for more than a year. The pains of angina were typical, there was most distressing palpitation, and throbbing of the carotids. Cactus gave marked relief in this case, but did not produce permanent results.

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In those cases classed as pseudo-angina, this agent is mentioned by some writers as a positive specific.

In tinnitus aurium accompanying heart faults in feeble patients, this agent has exercised an immediately beneficial influence. In hemoptysis where the circulatory excitement is great, and where there is much anxiety and nervous perturbation, it may be given in conjunction with *Lycopus*. Where epistaxis, hematemeses, or other hemorrhage occurs, accompanied with fluttering of the heart, syncope, a sense of suffocation, or other form of difficult breathing, with cold perspiration, and fear of impending death, *Cactus* should be given in full doses.

In recent attacks of impotency or in the early stages of the condition, where there is no permanent change, especially among the younger men, I have given it in conjunction with saw palmetto and *avena sativa*, with much satisfaction.

We have excellent authority for the use of *Cactus* with which to relieve functional disturbances of the heart in hysterical conditions, present at that time, and to exercise a nerve sedative influence. Where anemia or chlorosis complicates this condition, the combination of this remedy with others plainly indicated facilitates the action of all. The influence of the agent may be not only upon the heart and the central nervous system, but through a certain beneficial power which it seems to exercise on the female reproductive system. The indications for the use of *Cactus* are quite similar to those of *pulsatilla*, in this class of cases, and where irregularity of the reproductive functions seems to be the cause of the nerve irritation, and the two remedies are given in conjunction, with excellent results.

Dr. Lydia Ross has made extended and satisfactory observations concerning the influence of *Cactus* in the disorders of women. The oppressive headache in the top of the head, common to women at the menopause, which results from irritation or congestion within the pelvic organs, especially if accompanied with menorrhagia or other excessive hemorrhages, and present with the various forms of malposition, she believes will be relieved by *Cactus*. She especially advises it where there are hot flashes during the climacteric. It is given at this time in small frequent doses. Dr. Ross gives *Cactus* in conjunction with *helleborus niger* in these cases, if there is melancholia, nervousness, irritability of temper, hyperesthesia, neuralgia, vague fears and fancies, all of which conditions are influenced both by *Cactus* and *Pulsatilla*, either alone, in conjunction, or in alternation.

It is also indicated where there is irregularity of the menses, consisting of a too-early flow, or a flow too dark and thick, or too abundant, or one which ceases upon lying down, or where there is an

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inability to lie upon the left side. Other symptoms for which it is given in diseases of women, are those in which there is cerebral congestion, with pain and weight in the occiput, or in the vertex; numbness of the limbs, or areas of hyperesthesia, cough which seems to come from the suprasternal notch, or pain immediately behind the sternum.

For five years I have been experimenting with Cactus in the treatment of sub-normal temperatures, following the suggestion of Dr. Coffin of Indianapolis. My own observations, with those of Dr. Coffin and others, have confirmed me in the belief that this is an excellent remedy with which to elevate the temperature, especially if, accompanied with the depression of the temperature, there is also depression of the nervous system. The entire train of symptoms which accompanies protracted subnormal temperature I have found to be benefited by Cactus. There are some cases in which it will act, where strychnine and other usually useful remedies are of no avail. In other cases it materially improves the influence of the other remedies. I am anxious to receive reports on this influence of Cactus from other observers.

I have stated that this remedy is a true nerve tonic and restorative. I believe that it improves the nutrition of the nervous system by inducing a material improvement in the circulation of the brain and cord. It will be found of advantage in the treatment of quite a large number of cases of nervous exhaustion, and incidentally it may be mentioned that I have observed the band or cord-like sensation around the body to be more often present in these cases, especially if there is also present a greater or less degree of spinal irritation, with hysteria and erratic symptoms of disorder of sensation, more than disorder of motility. Some simple forms of paralysis, with other correct indications for this remedy, have been benefited by it.

In the heart faults of neurasthenics, this agent has an especial place. It acts as a general nerve tonic, while it improves permanently the action of the heart. This I have found especially true in aged persons. I have recently had an interesting experience where general decrepitude, with functional disorder of the stomach and heart both sharply pronounced, had been creeping on with an old lady, about eighty-five years of age, for the past three or four years. The point had arrived where death seemed likely to occur at almost any time from immediate failure of the heart, to which condition all interested had become resigned. Two drops of Specific Medicine Cactus every three hours seemed to gradually change these conditions so conspicuously, that it now looks as if at least five years had been added to the life of the patient, who is enjoying unusually good health.

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In the treatment of multiple neuritis, Cactus has been given where the heart disorders occur early, but as a result of the general disorder. If the remedy be persisted in, especially if tachycardia be present with low arterial tension, and deficient nerve force, Cactus is the indicated remedy.

In the last volume of the *Transactions* of our National Association, Dr. H. W. Felter, of Cincinnati, reports an unmistakable case of Reynaud's disease, of nearly forty years standing. Two years ago the case came into his hands. "Without much hope, I confess," he says, "I recommended Specific Medicine Cactus, in six-drop doses once a day. Faithful adherence to this medicine has worked a marvelous transformation in this case, absolute control of the paroxysms having been obtained as long as the medicine has been taken. On two occasions the patient has dropped the medicine for a period of two months, but with the return of the symptoms, but in a milder degree. A return to the medicine has given prompt relief, and while she still continues with her 'pleasant medicine' as she styles it, she considers herself practically cured. She has now taken the Cactus for nearly two years and has had the only comfort she has ever had from medicinal treatment since her young womanhood. She is now sixty-two years of age." *

There are occasional cases of chronic dyspepsia where from mal-assimilation the patient has become greatly emaciated and enfeebled, with a consequent enfeeblement of the various organs and functions of body, in which Cactus, given in conjunction or alternation with the agents commonly used for that purpose, will be found to be a most important addition to the treatment.

Cactus in Angina Pectoris.—J. Milton Sanders, M. D., LL. D., Professor of Chemistry in the Eclectic Medical College of New York, states his own case, under date of April 12, 1875:

"At the request of Dr. R. E. Kunzé, I shall attempt to write out a plain statement of my symptoms and of the medicinal effects of Cactus. It is necessary to say that I am of the encephalic temperament, and for two years past have been subject to unpleasant attacks of nervous irritability and apprehensive feelings regarding the state of my health. In all other respects I have enjoyed good health, with the exception of an occasional attack of dyspepsia. It was in the early days of November, 1874, that those symptoms made their appearance—at least in an aggravated form—without a note of premonition. Soon after I had taken a short promenade, the weather being cold and disagreeable, I was suddenly taken with a severe pain in the region of the heart and extending across the sternum. This pain was not so acute as it was heavy and strong. If I could

*This case had run the gauntlet of remedies used by Old School physicians through exceptionally talented authorities.

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compare it to electricity (and it would be an apt one), it might be likened to, not an *intensity* one, but one of *quantity*, for it appeared to be heavy, strong and full, and not acute. Each paroxysm was accompanied with great mental depression, which appeared to be a concomitant of the disease. The dyspnœa shortly after became so intense that my case resembled one of congestion of the lungs. Under various kinds of treatment life was barely kept in me, so great was my suffering, mentally and physically, coupled with the fact that nothing more could be done for me, it was not calculated to relieve in any way the depression of spirits. Inhalations of chloric ether and tar was the last remedy resorted to. Could not take the least exercise without bringing on paroxysms of intense cardiac pains, accompanied with mental anxiety and dyspnœa. Surface generally cold. In going around the block of houses to the Eclectic Medical College I usually had to stop and rest several times on the way and again after entering and before lecturing to the class. Even during the delivery of my lecture it often proved too much of an exertion for me, so that I had to desist sufficiently in order to let a paroxysm pass off, before I could conclude my remarks. Finally I thought that I should have to give up lecturing altogether. It was on the 12th day of November, having just delivered a lecture under very aggravating circumstances, that Dr. Kunzé met me in the lecture room and proposed an examination into my case immediately, for the purpose of testing the effects of *Cactus* on me, if the circumstances connected with it warranted the application. As I had previously been subjected to many examinations made by my colleagues, who managed to agree as doctors often do, without concurring as to the real facts of the case, I could not very well refuse. Having already been told that I was affected with an aneurism of the aorta, thereby corroborating a previous opinion given by an eminent physician of Macon, Georgia, nearly a year ago, I was desirous of having every one's opinion on the subject.

"Submitting to a hasty examination by the doctor in another room without any fire, where I dared not remove sufficient of my clothing to make it a critical one, I was told that my case was apparently one of *Angina Pectoris*. Pulse 96, regular but very feeble. Marked dyspnœa ascending a stair. A feeling of apprehension and an incubus in the præcordia. The doctor prescribed: *Cactus*, $\frac{3}{4}$ ss. Sig: Take ten minims in water, three times a day, till relieved.

"In twenty-four hours afterward I felt less nervous, and in a few days was enabled to take more exercise with less dyspnœa following. Cardiac pain not so severe. Pulse reduced to 84, with a better rhythm. Could walk to and from the college with less fatigue, and lecture with but little inconvenience. I could also lie down and sleep on my left side again, a thing I had not been able to do for two years past. Improving so very encouragingly I got somewhat careless again in taking the medicine regularly, and therefore when I perceived myself getting worse imagined that the remedy had lost its effect on me and finally ceased taking it altogether. The fact was I had lost all faith in any medicine until Prof. Newton assured me that I ought to continue it. This was about the middle of January, 1875. Pain returning with renewed strength I then suspected that the *Cactus* had done me some good. I then commenced to take this remedy again with more confidence; I took it regularly three times a day in doses of twenty minims. I now felt a slow but assured sense of relief, and after taking the same for three months I ceased to take it any more, as I had got relieved of the pain. The throbbing of the heart had entirely subsided; its rhythmic beating was reinstated and synchronously with the steady pulsations of the heart came back the more joyous pulsations of health."—*Trans. N. Y. State Eclectic Med. Soc. 1876.*

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Specific Indications and Uses.—By Prof. John M. Scudder, M. D., and others.—The common idea is that Cactus is the remedy for heart disease, and so it is if there is *irritability with feebleness*, the quick movement without strength. But I do not restrict its administration to cases of heart disease; given the quick movement without strength, and I would prescribe it in a case of fever, inflammation or functional disease. The influence of Cactus seems to be wholly exerted on the sympathetic nervous system, and especially upon and through the cardiac plexus. It does not seem to increase or depress innervation (neither stimulant nor sedative), but rather to influence a regular performance of function. I am satisfied, however, that its continued use improves the nutrition of the heart, thus permanently strengthening the organ.

The direct indication for Cactus is pain of a constrictive character—as if the parts were bound with an iron band—whether it be in spasm of the heart muscle or in menstrual nervous headache.

“Impaired heart-action, whether feeble, violent, or irregular; cardiac disorder with nervousness; præcordial oppression, anxiety, apprehension of danger, or death; hysteria; tobacco heart; nervous disorders with heart complications.”—(*American Dispensatory, Third Revised Edition.*) “Intermittent pulse; shortness of breath on slight exertion.”—Fyfe. *Essentials of Modern Materia Medica and Therapeutics.*

Dose.

R Specific Medicine Cactus, - gtt. v to 3 i.

Water, - - - - - $\frac{5}{8}$ iv.

Mix. Sig. One teaspoonful of the dilution every two or four hours.

PRICES OF CACTUS PREPARATIONS.

Specific Medicine Cactus.

$\frac{1}{4}$ -lb. Package, ...	\$1.25 each.	By mail, \$1.47 each.
$\frac{1}{2}$ -lb. “	2.40 “	Not mailable.
1-lb. “	4.75 “	Not mailable.

For sale by Pharmacists generally, and by all Wholesale Druggists of America.

LLOYD BROTHERS, Cincinnati, O.

JUNE 1, 1908.

ACTION.	CACTUS.	DIGITALIS.	STROPHANTHUS.	CONVALLARIA.	APOCYNUM.
On the Nervous System.	Is a true nerve tonic, especially to the sympathetic nervous system; acts on the cardiac plexus; materially improves nutrition.	Acts on the inhibitory nerves; does not impair nerve tone, or increase nerve force.	Does not act upon or through the nervous system.	Influence upon the nerve centers not determined; acts through the vagi.	Action on nervous system not marked. It seems to increase nerve force to a degree.
On the Heart.	Through the inter-cardiac ganglia, it gives actual nourishment to the heart muscle. Raises blood pressure through increase of muscular energy. In feebleness, slows the heart, but is never depressant; relieves irritability.	Acts directly on the heart muscle as a stimulant, increasing heart action. Is neither nutritional, nor a tonic; overdoses decrease nutrition; continued too long during heart strain, causes collapse.	Acts on the heart muscle by irritation of the fibrille by direct contact. Imparts no strength; increases force and raises blood pressure, sometimes excessively.	Acts permanently but mildly as a cardiac tonic. Increases heart power and raises blood pressure.	A mild heart tonic; increases muscular power permanently. It acts on the walls of the arteries. It raises blood pressure and increases arterial tension.
On the Pulse.	Increases the size of the pulse beat, and reduces the number, especially when rapid and feeble.	Changes, at once, the character and frequency of the pulse beat. Influence not always uniform.	Lessens the number of beats but increases their strength; overcomes irregularity. Its influence may be immediate.	Increases the size and strength of the pulse, and slows a rapid, feeble pulse.	Increases the size, strength and force of the beat; regulates the rhythm, slows a feeble pulse; in fevers accompanied with thraxys.
On the Respiration.	It relieves cardiac dyspnea especially if from endocarditis, or from pulmonary congestion, from weak heart.	It relieves dyspnea by increasing heart action and overcoming capillary stasis in the lungs.	Increases respiratory power, restores normal respiration. In overdoes the respiration is the last disturbed.	Removes oppression in the chest; causes deep, regular breathing. Overcomes dyspnea from initial insufficiency.	It gives freedom to the breathing when oppressed from effusions. It facilitates the oxidation of the blood.
On the Stomach and Bowels.	Exercises a soothing influence on the stomach; relieves palpitation from gastric irritation; induces no gastric nor intestinal disturbance; imparts functional tonicity to all organs.	Is a gastric irritant; it is rare that overdoses nauseate or induce diarrhea.	But little influence on the gastro-intestinal tract; rarely overdoses induce vomiting and diarrhea.	A mild gastric tonic, increasing the appetite and digestion; induces no irritation.	In a few doses, it is a violent provoking emetic; irritating, inducing extreme hypergastric action, and persistent gastro-intestinal irritation.
On the Kidneys.	Action not marked only as the heart's action is improved.	Increases the flow of water actively, in proper doses; secretion of solids not greatly improved. Overdoses may cause suppression of urine.	Acts directly on both secretion and excretion, causing at times marked diuresis. Action not always uniform.	Is a secondary diuretic; stimulates excretion and secretion to a degree; quite active in dropsy, inducing no depression.	Acts liberally, most freely; acts indirectly through influence on the heart. Induces large quantities of limpid urine; solids not greatly increased.
Therapeutic Uses.	Is not so much an emergency remedy, as it requires some time for its action. Used in prolonged or progressive heart weakness; in overstrained heart; in bicycle and cigarette heart; in masturbators' palpitation; in sexual and general neuromathenia. Acts best in functional derangements.	Acts at once in shock, and in sudden heart failure, in creating heart action promptly. Used in surgical shock, or shock from injury; in asphyxia and in poisoning; in heart failure from prostrating disease, as in the latter stage of pneumonia. Is of much value in selected cases of valvular incompetency.	Is an emergency remedy in heart failure, but inferior to digitalis. Indicated where heart lacks contractile power, as in cardiac asthma, anæmia, and fatty degeneration; in the weak heart of Bright's and in functional derangements. Its influence continues long after the agent is stopped.	Relieves irritable heart action; restores strength to the heart after failure from shock, or protracting disease; used in cardiac dropsy and in functional derangements.	Is not an emergency heart remedy, except in failure during extreme dropsy and in hydropericardium. Its influence on the heart is slowly induced; is valuable in progressive heart weakness, especially in protracted fevers. It is a most reliable remedy for dropsy.
Synergists.	Action improved by tonics which improve nutrition, by general upbuilding remedies, and by avena sativa.	Action enhanced by strychnine, by glonoin, and occasionally by atropine and brandy. In chronic heart disease, by general tonics.	Acts well with carefully selected tonic; facilitates the appropriation of iron, in anæmia accompanied with heart weakness.	Nux vomica, hydnastis, colinsoma, and iron increase its influence, as well as the usual gastric tonics in gastric derangements.	Action enhanced by cathartics, by ordinary tonics and iron. Strychnine arsenate assist, materially in some cases. Its influence on dropsy, it is

A TREATISE

ON

Pilocarpus (Jaborandi).

The Therapeutic Uses are written for this Treatise by Professor HERBERT T. WEBSTER, M. D., Author of Principles of Medicine, Dynamical Therapeutics, and The New Eclectic Medical Practice. Formerly Professor of Materia Medica and Therapeutics, and again of the Principles and Practice of Medicine, California Eclectic Medical College.

The Uses in Eye, Ear, and Throat, by Professor KENT O. FOLTZ, M. D., Professor of Didactic and Clinical Ophthalmology, Otology, Rhinology, and Laryngology, Eclectic Medical Institute, Cincinnati, Ohio. Author of "Diseases of the Eye."

The Illustrations are drawn by Mr. W. F. HAMMER.

The Description, History, Chemistry and Pharmaceutical record are by JOHN URI LLOYD.

Treatise No. I embraces Thuja Occidentalis and Crataegus.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. IV will embrace Veratrum Viride.

Drug Treatise, Number III.

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PILOCARPUS.

(JABORANDI.)

Part Used.—"The leaflets of *Pilocarpus selleanus*, Engler (Rio Janeiro Jaborandi), and of *Pilocarpus Jaborandi*, Holmes (Pernambuco Jaborandi)."—U. S. P., 1890. The Pharmacopœia, 1900, will recognize only *Pilocarpus microphyllus*, Stapf.

Name.—The name Jaborandi is given in South America to a number of shrubs belonging to the Rutaceæ and Piperaceæ, the leaves of many of which are exported under the common term, Jaborandi. Hence, this name, "Jaborandi," should be either abandoned in medicine, or confined exclusively to the official (1000) species, *Pilocarpus Microphyllus*.

History.—About 1854, Lemaire described *Pilocarpus Pennatifolius*, then of botanical interest only. In 1874, Dr. Coutinho, a Brazilian physician, carried the leaflets to Paris, and the drug soon attracted attention as a sialogogue (Fig. 8). Orders were now sent to South America from both Europe and America for "Jaborandi," and as a result, because of the indiscriminate use of the term, the leaves of many shrubs came back. Some of these were true to the species desired, others were varieties of the authentic species, and others still were sophistications, admixtures and substitutes. Probably in no instance connected with a botanical specimen have we a record of such gross imposition, such deliberate substitution, such careless attention in collecting and distributing as then prevailed and still prevails in the case of *Jaborandi*. Since that date (1875), this drug has presented the most exasperating problem that has confronted the careful selector of crude drug materials. The name *Jaborandi*, which meant nothing definite twenty-five years ago, means no more to-day. Under that term drugs true to name, varieties of the official species, sophistications and admixtures still hold the market, one especially (see Fig. 9) being actually harmful in character. In this connection it may be stated that our recent attempt to procure in America a lot of prime pilocarpus resulted in but one offer on guarantee, and that drug (not the desired species) assayed us by accepted standard less than one-fourth strength. One hundred pounds of the officinal species (U. S. P., 1890) worked a short time since yielded less than twenty pints of *Specific Medicine Jaborandi*. The day this is written not one bale of true *Pilocarpus microphyllus* can be found in our market, although an abundance of "Jaborandi," of other species, is to be obtained.

JABORANDI.

Names and Varieties.—In commerce the meaningless terms Pernambuco Jaborandi, Paraguay Jaborandi, Maranhão or small Jaborandi, Ceará Jaborandi, Aracati Jaborandi, Rio Janeiro Jaborandi, and other names prevail, all relating to either the country where the drug is grown, the part of South America that exports it, or to the common term applied by the people. It may be confidently stated that unless one is versed in botany and pharmacology, and indeed is experienced in the special field of the drug known as "Jaborandi," he may expect to meet with gross imposition if he ventures to purchase the crude drug under any of these titles or by the common name "Jaborandi."* Nor is this necessarily due to intent of either importer or jobber, for, in general, each dealer in this foreign drug is helpless in the face of confronting conditions that, as with collectors at a distance, lie entirely beyond control. Mr. E. M. Holmes, the best European authority (see also Index Kewensis), states that the following species and varieties were known, under the name of *Jaborandi*, as early as 1895. Since which date two other species have been added.†

LEAVES SIMPLE.	LEAVES COMPOUND, IMPARIPINNATE.
<i>Pilocarpus spicatus</i> ,	<i>Pilocarpus goudotianus</i> ,
" <i>subcoriaceus</i> ,	" <i>heterophyllus</i> ,
" <i>longiracemosus</i> ,	" <i>trachylophus</i> ,
" <i>pauciflorus</i> ,	" <i>pennatifolius</i> ,
" <i>latifolius</i> ,	" <i>selloanus</i> ,
" <i>guianensis</i> ,	" <i>jaborandi</i> ,
" <i>humboldtii</i> ,	" <i>microphyllus</i> ,
" <i>racemosus</i> ,	" <i>grandiflorus</i> ,
" <i>riedelianus</i> ,	" <i>macrocarpus</i> .
" <i>giganteus</i> .	

Let us now supplement these general remarks by more specific descriptions.

GENERAL CHARACTERISTICS OF THE SPECIES OF *PILOCARPUS* (*JABORANDI*).‡

As found in commerce the leaflets are much broken and usually detached from their rachis. They are unequally pinnate, the midrib dividing the terminal leaflet into approximately equal halves. The

*In our opinion the American authority most accomplished in "Jaborandi" problems from the botanical side is Professor H. H. Rusby, M. D., of New York City. His recent paper, presented to the American Pharmaceutical Association and published in the Bulletin of Pharmacy, October, 1903, is invaluable.

†British Pharm. Journ. and Trans., 1895.

‡Again we refer to the admirable treatise by Professor Rusby, which has been freely consulted in this part of our study. The illustrations are all, excepting Fig. 9, made from natural leaves and drawn by Mr. W. F. Hammer.

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lateral leaflets are oblique, that is, narrower on one side of the midrib, the two sections being of unequal shape by reason of the portion on the upper side of the midrib being the shorter. (See Fig. 6.)

The base of the leaflet may be *rounded* (Fig. 1), *acute* (Fig. 2),



Fig. 1.—ROUNDED BASE.



Fig. 2.—ACUTE BASE.

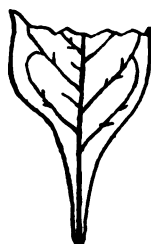


Fig. 3.—TAPERING BASE.

or *tapering* (Fig. 3). In referring to our illustration of the entire leaf, *Pilocarpus Microphyllus* (Fig. 6), it will be observed that the terminal leaflet is tapering, the base leaflets rounded, while those between them become progressively acute from the base upward. This characteristic we have noticed with all the specimens we have studied and indicates why the shattered drug thus varies.



FIG. 4. FIG. 5.
SHOWING EMARGINATE SUMMITS.

The summits of the leaflets of all the species of *Pilocarpus* are almost invariably *emarginate* (Figs. 4 and 5). If the leaflet be held between the eye and a strong light, especially if a magnifying glass be used, *transparent dots* (like pin points) are to be observed (see Fig. 11). These two characteristics (emarginate summits and pin-point dots) distinguish the *Jaborandis* from other species of shrubs observed as sophisticants. But they neither identify the valuable species of *Jaborandi*, nor indicate therapeutic qualities. Utterly worthless varieties conform to these descriptions. Even the dissimilar *Pilocarpus trachylophus* (Holmes) (see Fig. 9), the most abundant drug of the market, and "worse than useless" (Rusby), presents the general features of these descriptions, not excepting the transparent dots. The man who selects *Jaborandi*, intelligently, must draw yet closer lines. *But one species should be used*, and he must *know* that species. At the outside, *but one of the many related varieties can be tolerated*, and that only in emergency cases. (See Fig. 7.)

***Pilocarpus microphyllus* (Stapf).—The Best Species.**—And, as has been stated, the only "*Jaborandi*" to be official in the forthcoming Pharmacopœia of the United States is *Pilocarpus micro-*

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phyllus, Stapf. It is the *small leaved* Jaborandi, called in commerce *Maranham* Jaborandi, which term (*Maranham*), however, indicates only the name of the South American point of export. The fact is, we do not know where this species of Jaborandi is gathered. It comes to market from the interior of South America, and that statement covers our knowledge concerning its habitat.

Description.—The leaflets are unequal, oval to obovate, from one-half to one and one-half inches long, and about half as wide. The midrib is heavy, the veins coarse. The terminal leaflets are equally ovate to obovate, have a more tapering base than the lateral leaflets, and are narrower. Immature, paper-like, green leaves, as well as brown, over-ripe and partly decayed leaves are to be avoided. In many instances the curing process is defective, the central parts of the bales being mouldy, or injured through moisture. This is true, however, of all other varieties. The prime drug is firm in texture, the veins and pin-points distinct, the color green, but not too deep, the odor herby. The taste, slightly aromatic, passes into a touch of saline (Nitrate of Potassium, see p. 8) followed by bitterness upon prolonged chewing.

Sophisticants.—Aside from the inferior or harmful Jaborandis, the leaflets of a species of *Swartzia* is on the market. This is an absolute fraud, bearing a fairly close resemblance to Jaborandi, suf-



Fig. 6—*PILOCARPUS MICROPHYLLUS* (Stapf).

[True Jaborandi—U. S. P., 1890.]

Natural Size.

Drawn from the leaf by Mr. W. F. Hammer.

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ficient, possibly, to deceive the unwary, the willing, or the inexperienced, but lacking both the *leaf dots* and the *emarginate* apex.

Pilocarpus Jaborandi (Holmes) is the next in importance. In fact, it is the only other variety to be sanctioned at all. It is in marked contrast to the foregoing, in that it is the *stiffest* and heaviest of all the Jaborandis. It is from two to five inches long, yellowish-green, smooth, stiff, almost like card-board to the touch, very prominently and and reticulately venated (Fig. 7).

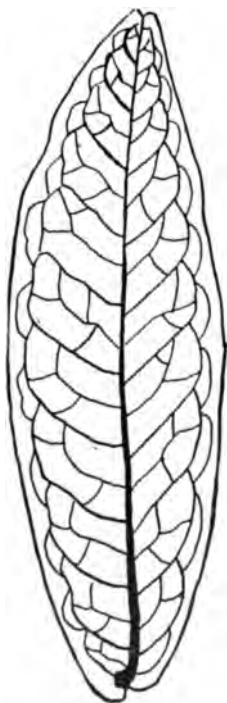


Fig. 7 PILOCARPUS JABORANDI (Holmes).
Natural Size.

Drawn from the leaf by Mr. W. F. Hammer. This species occurs twice the size of this specimen, the drug varying much. It is the only permissible substitute for *Pilocarpus Microphyllus*.

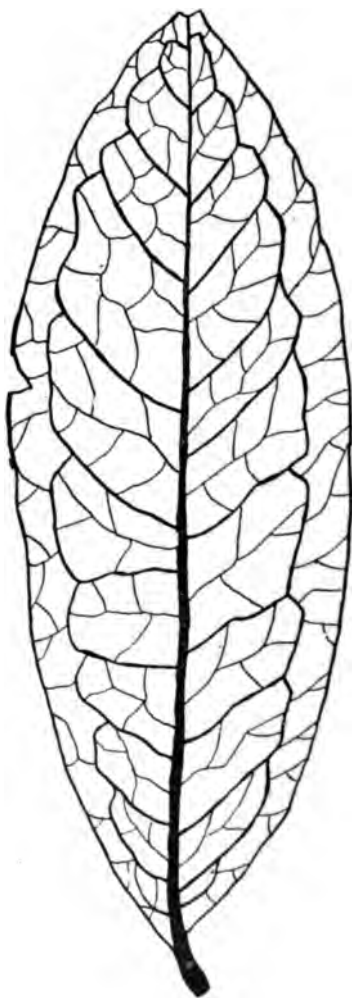


Fig. 8—PILOCARPUS TINNAIFOLIUS (Lam).
Natural Size.
Drawn from the leaf by Mr. W. F. Hammer.

Sophisticants.—So-called Rio and Paraguay leaves (included in the terms *Pilocarpus selleanus*, Engler) are sold for this species. The Rio is very poor, the Paraguay more so, neither being stiff and brittle to the touch. Neither species should be employed in medi-

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cine, and yet both are found in market in abundance. Drawings Nos. 7 and 8 are much alike, but the leaves differ materially in texture and surface appearance, the most characteristic distinction perhaps being the stem base, as shown by our artist. *Other Sophisticants and Substitutes* or at the best *Poor Varieties* may be named as follows:

Pilocarpus Trachylophus (Holmes), known as *Ceara*, is an off shade, dark, narrow leaved variety, about half as long as the *Pilocarpus Jaborandi* (Holmes) (Fig. 7). The dried leaves are thick in texture,



Fig. 9.—**PILOCARPUS TRACHYLOPHUS** (Holmes) "*Ceara*." (Natural Size.)
Drawn from the leaf by Mr. W. F. Hammer.
A dangerous substitute for true jaborandi.



Fig. 10.—**PILOCARPUS SPICATUS** (St. Hil.) (Natural Size.)
Drawn from the leaf by Mr. W. F. Hammer.
The rounded summit, shown in drawing, is often more acute.



Fig. 11.—**PILOCARPUS RACEMOSUS** [Naudeloupe Jaborandi.] (Natural Size.)
Pharm. Journ., London, Nov. 14, 1908.

much doubled, the edges much folded, reminding both in dark color and in their creased appearance of eriodyction leaves. This is a dangerous substitute, because of dissimilar qualities (Rusby), and yet is very widely sold on the market. Indeed, *it is the most abundant variety*. **Pilocarpus spicatus** (St. Hil.) (*Aracati Jaborandi*) (Fig. 10), a brown stemmed, coarse drug, disagreeable in odor and taste, is also to be avoided. Mixtures of similar leaves, of dissimilar leaves, and of yet other varieties of *Pilocarpus*, confront men concerned in commerce and in medicine making, but for de-

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scriptions in detail, space is herein lacking. The accompanying Fig. 11, just thrown on the London market and described by E. M. Holmes in the Pharm. Journal, London, Nov. 14, 1903, as Guadeloupe Jaborandi is probably (Holmes) *Pilocarpus racemosus*. It affords the alkaloids found in the official species.

To this it must be added that even though Jaborandi be true to name it is not necessarily of fitting quality. A specimen of *Pilocarpus microphyllus* from five bales, now before the writer, is badly cured and inferior. Another specimen of five bales is much mixed with trash and stems. Yet other specimens grade from indifferent to prime.

Constituents.—As might be expected the chemistry of "Jaborandi" is in a chaotic condition. The one conspicuous product is the alkaloid *pilocarpine* (discovered independently, 1875, by E. Hardy, in France, and A. W. Gerrard, in England), but this is one constituent only, for a number of fortifying or modifying acids and basis are to be obtained from, or are present in the plant. Practitioners of medicine know from experience that a preparation of true *Pilocarpus microphyllus* carries qualities distinct from those of the alkaloid which, in itself, as found in commerce, is not necessarily a uniform agent, and, as is shown by the melting points, as well as by observation of the substances obtained under the name *pilocarpine* from different species of plants, must be taken with much discriminative allowance. A qualified student of *Materia Medica* can distinguish the official leaf and fairly judge of its condition (no pharmacist need ask an excuse for not knowing the true drug), but yet few can draw alkaloidal distinctions between the alkaloidal products of the various species, which, indeed, remain yet to be studied. The most abundant spurious drug (*Pilocarpus Trachylophus*) yields an alkaloid that is worse than useless, because it is *antagonistic* to the principal alkaloid of the official leaf, few being familiar with its chemical distinctions. The so-called active principles of the Jaborandis embrace the alkaloids *jaborine*, *pilocarpidine*, *jaboridine*, *jaborine*, and the acids *jaboric* and *pilocarpic*, as well as other products and educts, among which is potassium nitrate, obtained by us in crystals. The chemistry of these Jaborandi bodies is enough, almost, to take the life study of a specialist, and the distinctions and relationships of these products in natural association, or as separate products, are not less an enigma than are the structures themselves.

The complications to be found with Jaborandi, 1st, in the botanical source, 2nd, pharmacology and histology of the drug, 3rd, its chemistry, and its uncertain educts, indicates that an established pharmaceutical preparation made of the true species, worked by a

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process that results in a uniform product, by a system of determinations supported by the clinical experience of practitioners, serves best and most surely the practitioner. This we believe, basing our opinion on our experience in selecting the drug, in working it, and on the reports that come to us from physicians who employ our preparation of *Pilocarpus microphyllus*. On the use of such a preparation has the value of the drug been established by the physicians contributing the therapy of Jaborandi to this article, and not on any fractional alkaloidal educt, or preparation of a related species.

PHARMACEUTICAL PREPARATIONS.

Fluid Extract. The Pharmacopœia of the United States (1890) gives a formula for a fluid extract, which may be made of either the leaflets of *Pilocarpus selloanus*, Engle, or of *Pilocarpus jaborandi*, Holmes. In fact, however, the commercial fluid extract is probably largely made of the mixed commercial varieties of the drug, for large amounts of these are sold, and the fluid extract is the only pharmaceutical preparation employed to any extent outside the Eclectic and Homœopathic professions. It is a dark, red-brown or greenish liquid, much given to precipitation, and possibly to structural alteration as well as to the observed physical change. Its taste is herby, insipid, leaving a slight bitterish after-taste.

Specific Medicine. This preparation, the favorite of Eclectic physicians, is, in our opinion, the choicest of the preparations of Jaborandi. It is invariably made from the select small leaf species (*Pilocarpus microphyllus*), and is of an exactness that results from a long continued special study of the drug manipulated in large amounts. It has a deep green color,* an herby odor and taste, leaving a decided after-taste that is characteristic of the drug. When dropped into water, it makes a greenish, opalescent solution which does not precipitate to any great extent, if at all. We supply it when we can get the prime authentic drug to work, otherwise we decline to furnish the Specific Medicine.

Summary. This study presents but a touch of the Jaborandi problem. It is not intended to do more than identify the true drug, point to its sophisticants, and comprehensively indicate the perplexing conditions that involve those concerned in supplying to

* We consider this coloring matter of no medicinal value.

NOTE.—For Historical treatises on "Jaborandi," see papers of E. M. Holmes, London, in *British Pharmaceutical Journal*, 1895. For Botanical and Commercial studies, see paper by Professor H. H. Rusby, M. D., New York, *Am. Phar. Assoc.*, 1903. For "Constitution of Pilocarpine," see work of H. A. D. Jowett, D. Sc., *Wellcome Research Laboratory*, London, *Frederic Power*, Ph. D., Director. These, in addition to a multitude of treatises in all languages, are to be found in the *Lloyd Library*, and are at the service of the public.

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physicians authentic preparations of this drug, which, if the drug be true to name, are, as both Dr. Webster and Dr. Foltz state, invaluable, but which from false species or spurious alkaloids may not only be useless, but positively harmful. Uncertainties of market conditions, both concerning species and quality, have often tempted us to cut the name of Jaborandi from our medicine list.

THE THERAPEUTICS OF JABORANDI

(With Classified Uses from Dynamical Therapeutics).

BY PROFESSOR HERBERT T. WEBSTER, M. D.

General Remarks.—Few drugs can serve as many different purposes through modification of dose as Specific Jaborandi; and, I may add, in my opinion, few are so susceptible to loss of quality by pharmaceutical manipulation. I have tried various samples of the remedy from numerous drug houses within past years, but have never been fully satisfied with any preparation other than Lloyd's Specific Medicine. Other reliable fluid preparations of this agent may exist, but I have never found them. The remarks I shall offer here, therefore, are predicted upon my experience with the Specific Medicine.

In full doses, Jaborandi is the remedy of all others for establishing a favorable crisis in severe forms of acute disease. In inflammatory rheumatism, in pernicious malarial fever of different forms, in the wild delirium of typhoid fever, and in the intense pain of acute pleuritis, a drachm dose of this drug will often bring the disease to a favorable termination within an hour or two, when ordinarily we would not expect drugs to accomplish anything at all, unless from extended use. Sometimes the stomach will not tolerate the drug, and sometimes absorption may not go on properly, as in bad cases of congestive chill, and we then employ a corresponding dose of pilocarpine hypodermatically; but where it can be administered by mouth, specific Jaborandi is the remedy *par excellence*. Profuse perspiration does not always attend its action, but it equalizes the circulation, relieves internal organs of congestion, and promotes an even distribution of capillary blood, thus, often, disposing of urgent and dangerous symptoms.

In my work on the Practice of Medicine (Vol. I, 1899) I call attention to the speedy influence of this drug, in full doses, in the comatose, delirious, and colliquative forms of pernicious intermittent fever. My experience in past years has warranted all I have there written; and, since the publication of that work, several of our

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physicians have testified to the efficacy of such treatment by publishing articles of similar tone (Drs. Kinnett and Wolf, in Transactions N. E. M. A.). Dr. Wolf applies the principle to typhoid fever, and relates surprising effects in some cases of dangerous delirium in that disease, where a single drachm dose of Jaborandi nearly established convalescence in a few hours and permanently banished the delirium. We probably possess no other remedy so capable as this of establishing a permanent and favorable crisis in severe febrile diseases where a fatal issue seems imminent.

In smaller doses, Jaborandi is one of our most reliable remedies of the class designated by Prof. Scudder as "special sedatives." Attention to this property was first called in my Principles of Medicine, published in 1891. Since that time the drug has become a prime favorite with many of our school for lessening rapidity of the pulse, reducing the temperature, and calming the erethism of various febrile and inflammatory diseases. It has few rivals and no superior among this class of agents. It should be preferred to aconite in all sthenic cases of the kind, and is not objectionable in asthenic cases, if the dose be properly regulated. It possesses the salutary property of imparting a cooling sensation to the skin during its action, which is very grateful to patients suffering with pyrexia. It also relieves headache arising therefrom, calms nervous irritability, and soothes local inflammatory action. In addition to its applicability in idiopathic forms of fever, it is excellent in many forms of symptomatic fever, such, for example, as pneumonia, erysipelas, and acute rheumatism. In pneumonia it does well either alone, or in combination with *asclepias tuberosa*; in rheumatism, especially the inflammatory form (acute articular), it is a favorite agent in combination with *Rhamnus californica*. In erysipelas, *echinacea* is a good companion remedy, though the specific properties of Jaborandi are sufficient to recommend it as a specific agent in this as well as in kindred complaints.

Jaborandi possesses minor properties which also recommend it. While I have called attention to its everyday uses by the general practitioner, we must not forget its specific action on the parotid gland, which commends it in parotitis, in ptyalism, in suppression of milk, due to a specific action on the mammary gland, in colliquative sweating; also as a hair tonic, taken both internally and applied locally. The uses of pilocarpine by oculists and aurists are not legitimately within the confines of this article.*

Another property highly prized in some quarters is the action of Jaborandi in rigid os uteri. Here it ought to be given in full doses, say thirty drops in water, repeated once or twice, if necessary.

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Besides its action on the skin, parotid and mammary glands, and hair follicles, Jaborandi also specifically influences the throat, and it has been recommended as a safe and sure remedy for stubborn throat affections (pharyngitis diphtheria and membranous croup). Several years ago Dr. K. O. Foltz recommended it as a specific for minister's sore throat. My experience tends to confirm this statement, though the action is not as positive as in some other directions. I have derived splendid results from it in a few cases of stubborn aphthæ, attended by ptyalism.

On the Circulatory System.—In minute doses Jaborandi relieves irritability of the heart and blood-vessels, and tends to induce a normal equilibrium of the general circulation when this has been disturbed by febrile action. In large doses it produces profuse perspiration, coldness of the surface, ptyalism, vomiting and sinking sensation; carried further it may cause complete diastolic arrest of the heart's action.

Under judicious dosage it is our most valuable arterial sedative, promptly controlling febrile action, lowering the temperature, and promoting normal secretion from the skin, lungs and kidneys, while the circulation is equalized and an agreeable sensation of coolness and comfort imparted to the general cutaneous surface. It is thus valuable in all forms of fever not marked by great adynamia, and in inflammatory conditions its general effect is attended by amelioration of the local hyperæmia of highly satisfactory character. We probably do not possess another as valuable agent in inflammation attended by sthenic conditions as this in our entire materia medica.

In inflammatory rheumatism, from the most active forms, where the tissues are swollen to fullness of the skin, and the pain is excruciating, to more passive forms, where joints are swollen and stiff, but not exceedingly painful, there is nothing in the materia medica like it for promptness of action in relieving the local symptoms. Under its influence, though here a few full doses may be needed, the most severe pain subsides, and swelling and redness are soon gone—not that there need be redness to indicate it, for many of these cases may be so sub-acute as to be pale and painless, though the joint may be swollen and stiff. Some of these patients may be able to attend to their daily vocations, though complaining of swelling, soreness and stiffness in the joints. I find Jaborandi to be the best prescription here.

Jaborandi has other valuable uses which will be noticed in their proper order.

Dose.—Where prompt action is desired to relieve severe pain, from fifteen to thirty drops of the Specific Medicine may be given at a dose, and repeated in half an hour if necessary, though I would not recommend the repetition usually within the hour. As a febrifuge and antithermic—sedative to the arterial system—I would add from one to four drachms of Specific Medicine to four ounces of water and administer a teaspoonful every hour.

On the Digestive Organs.—Jaborandi specifically influences the salivary glands and mucous membrane of the mouth and fauces. It is useful to arrest ptyalism and stomatitis, especially the aphthous form.

I have cured aphthæ complicated with profuse ptyalism promptly with Jaborandi, after several other remedies had failed.

Dose.—Add ten drops of the Specific Medicine to four ounces of water and give a teaspoonful every two hours.

*See special contribution of Professor Kent O. Foltz, M. D., pp. 14 to 16.

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On the Respiratory Organs.—Jaborandi controls excitement of the general circulation, in appropriate doses, and thus becomes a valuable remedy in all cases of acute inflammation of the respiratory organs.

It is of service in the early stages of bronchitis, combined or alternated with elecampane, potassium bichromate, bryonia, aconite, etc. In pneumonia, it combines or alternates well with asclepias, in the early stage, and with potassium chloride, during the stage of exudation. Administered with caution, it is one of the best sedatives we possess in all inflammatory conditions of the respiratory organs in their active stages.

Dose.—One to five drops of the Specific Medicine, every one or two hours.

On the Urinary Organs.—Jaborandi is sometimes useful in diabetes insipidus, combined with ergot, to arrest the excessive discharge of water. It is also useful in the albuminuria of pregnancy, used in doses sufficiently large to stimulate sweating, which should be kept up profusely until time for the effect to become beneficial has elapsed.

Jaborandi has been employed in some quarters in the advanced stage of Bright's disease to produce a vicarious action of the skin and relieve the system of the effects of retained urinary elements through the sudoriparous glands. Such treatment must however be temporary in result.

Dose.—To produce free diaphoresis, ten drops of the Specific Medicine, repeated every one or two hours. Larger doses, if they are to be repeated for any great length of time, should be used with caution and watchfulness. From the fraction of a drop to five drops may be employed in the treatment of diabetes.

On the Muscles.—I think that we possess one of the most positive remedies for muscular pain in Jaborandi that the materia medica contains. Especially adapted to acute forms of muscular pain, and sometimes acts admirably in chronic cases.

One of the positive indications for the administration of Jaborandi in muscular pain is that of *puffiness* of the surrounding tissues. In inflammatory rheumatism, where the parts involved are swollen and painful, whether reddened or not, Jaborandi is *the* remedy of all others.

In severe muscular spasm, where the suffering is intense, a full dose of this remedy will often relieve promptly; if it fail, a repetition of the dose within an hour will alleviate materially and prepare the way for the use of the remedy in smaller doses. If two or three drachms now be added to four ounces of water and a teaspoonful of the mixture be given every hour a few hours will suffice to relieve the difficulty, even if it be a severe attack of muscular rheumatism.

In sub-acute attacks of rheumatism, where there is some pain and considerable swelling about the joints, rendering them sore and stiff, Jaborandi in the small doses mentioned will banish the difficulty in a few days, even if it has been standing for months.

I have employed Jaborandi with complete satisfaction in lumbago of severe character after cimicifuga had failed to relieve. In all forms of chronic rheumatism, except where there has been organic change, it should be tried as a *dernier resort*.

Severe abdominal pain, pleurodynia, rheumatism of the heart—in fact muscular pain of any character—will yield more promptly to Jaborandi than to any other remedy, unless it be antipyrin, antifebrin, phenacetin, or some other of the preparations that are objectionable on account of their debilitating influence. Jaborandi is much safer, though it may also be overdone as to size of dose, and should be used with judgment.

Dose.—Twenty drops of the Specific Medicine is a full dose.

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On the Skin.—The action of Jaborandi in producing profuse perspiration is well known. Sometimes this action is useful in establishing an artificial crisis early in the onset of continued fevers, where it may be aided by the action of a vapor bath. Another action of Jaborandi is its influence in arresting profuse perspiration due to relaxation of the cutaneous vessels. Here the dose must be very small, only a few drops of the Specific Medicine being used in four ounces of water, a teaspoonful of the mixture being given every three or four hours. The dynamical influence here is what is required and care must be observed that the dose be not so large as to cause the drug effect instead.

Dosage.—The drachm dose, for establishing a crisis, has already been suggested. This ought not to be repeated, unless under particularly aggravated circumstances. If the one dose does not succeed, it is doubtful if the second will do so. As a vascular sedative, add two or three drachms of the Specific Medicine to four ounces of water, and give a teaspoonful every half hour or hour. Every half hour is good dosage, until a few doses have been administered, say four or five, then the dose may be given once an hour with good effect. In pyralism and to relieve profuse diaphoresis the dose may be as small as ten drops to four ounces of water, a teaspoonful every one or two hours. As a galactagogue, ten to fifteen drops should be administered at a dose, three or four times a day. As a specific remedy for the hair the dosage ought to be about the same. It increases the growth of the hair, causing it to grow thicker, and also improves its color. It is said to have turned light hair dark.

PILOCARPUS OR JABORANDI IN EYE, EAR AND THROAT.

BY PROFESSOR KENT O. FOLTZ, M.D.

Pilocarpus possesses a marked influence on the secretory glands, not only of the skin and mucous membranes, but also of all the secreting organs of the body. That certain results will follow the proper administration of a well-made preparation of the true drug is unquestionable; but the number of spurious or inferior quality of leaves sold which are practisally inert, will lead to many disappointments. The peculiar alkaloidal principle upon the natural combination of which the remedy largely depends is pilocarpine, but other constituents are undoubtedly of value, as the results obtained from the use of the alkaloid alone are not as satisfactory as from a carefully prepared preparation of a good specimen of the true drug. The alkaloid has its place; the drug has its field.

As Pilocarpus is a favorite of mine, I have tried many preparations in the market sold under the trade name jaborandi, but the majority have been disappointing in their action, and for the last

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twelve years I have used only the Specific Medicine Jaborandi, which has given uniformly good results. But, unless the proper indications for the drug are observed, failure will follow.

The general effect noticed in the cases where I administer pilocarpus, is, increased flow of bile, with the accompanying increase of appetite, better digestion, and more or less improvement in the action of the bowels. These results have been observed incidentally in treating diseases of the eye, ear, nose and throat. In a similar manner my attention was called to the relief obtained in a case of dysmenorrhea, which was reported by me in the *Eclectic Medical Journal*. Since the article appeared, 160 reports of cases have been received of its use in this disease and with uniformly good results when of the neuralgic type.

In eye diseases the drug is regularly employed in iridocyclitis (so-called serous iritis), in plastic and traumatic iritis, as the exudate is more rapidly absorbed, and the discomfort of the patient lessened. In rheumatic iritis, it should be given in full doses until the physiological effects are obtained, then keeping just within this action of the drug. In hyalitis, and also in glaucoma simplex good results have been obtained in a number of cases. In optic neuritis, pilocarpus has markedly benefited the majority of cases; if the disease is of syphilitic origin, iodide of potassium should be combined or alternated, giving both in doses to procure their physiological effects. In traumatism of the eye, with effusion of blood into the aqueous or vitreous, there will be a more rapid absorption of the blood by the use of moderate sized doses. In retinal hemorrhages and chorioretinitis, absorption takes place more rapidly, and with less destruction of nerve structure than with any drug I have used. In detachment of the retina, pilocarpus has apparently aided in effecting a re-attachment of the tunic. In nearly all choroidal diseases, through the more rapid absorption of the deposits, the resulting lesions affect visual acuity less than would otherwise occur. In beginning atrophy of the optic nerve, the disease has apparently been controlled. In interstitial keratitis the drug will often materially aid in clearing the corneal tissue. In chronic conjunctivitis, with diminution of secretion, or the character so modified as to produce either a sensation of, or actual, dryness of the conjunctival surfaces, pilocarpus will give good results by increasing glandular activity. Croupous and diphtheritic conjunctivitis will also be favorably influenced by the drug.

In ear diseases the use of pilocarpus is more limited. In dry eczema of the external auditory canal, pilocarpus will often cure by stimulating the secretory glands. In chronic catarrh of the middle

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ear of the sclerosing or dry form, pilocarpus will either materially increase the acuity of hearing or effect a cure, but the treatment must be continued for a long time. In effusion into the labyrinth, the drug will often promote absorption and in many cases, unless syphilitic with sudden loss of hearing, partially restore the hearing.

In atrophic rhinitis and atrophic pharyngitis (pharyngitis sicca) the drug will relieve not only unpleasant dryness but will increase the activity of glands that have not been destroyed.

In laryngitis, when there is lack of secretion through inactivity of the mucous glands, relief is usually prompt.

In tabes dorsalis excellent results have been obtained by the use of pilocarpus in a number of cases.

Dosage.—Each case must be carefully studied, and the remedy intelligently administered. As a general rule the Specific Medicine is given in from 1 to 5 drop doses in chronic cases. In acute cases from 3 to 10 drops at a dose, in a little water, until the physiological effects are obtained, then diminish the dose, just keeping within the physiological action. I have refrained in this paper, excepting in one instance, from suggesting any drug combination, as any indicated remedy may be combined with it.

Indications.—When there is dryness of the tissues or perversion of secretion which is deficient in quantity; atrophy of mucous or submucous structures. Effusion or exudation into serous tissues or cavities. These indications I have found to be effective.

Contra Indications.—Over activity of glands, with profuse watery secretion.

PRICES OF JABORANDI PREPARATIONS.

(We quote only the Specific Medicine, which is the pharmaceutical preparation recommended by the authorities contributing the therapy of this drug. We consider it the most energetic and valuable Jaborandi preparation.)

$\frac{1}{4}$ -lb. Package.....	65c. each.	By mail, 87 cents.
$\frac{1}{2}$ -lb. "	\$1.25 "	Not mailable.
1-lb. "	2.50 "	Not mailable.

January, 1, 1904.

LLOYD BROTHERS, Cincinnati, Ohio.

A TREATISE
ON
Veratrum Viride.
(AMERICAN HELLEBORE.)

Selected Cases and Remarks on Veratrum are written for this Treatise by Professor ARTHUR WEIR SMITH, A. M., M. D., late Professor of Materia Medica and Therapeutics in Bennett Medical College, Chicago, Ill.

The Therapeutic Uses are written for this Treatise by Professor H. W. FELTER, M. D., Professor of Chemistry and Anatomy, Eclectic Medical Institute, Cincinnati, Ohio; author of the Therapy and Materia Medica of the American Dispensatory; editor of Locke's Syllabus of Materia Medica and Therapeutics.

The Illustration is drawn for this Treatise from the drug by Mr. W. F. HAMMER.

The Description, History, Chemistry and Pharmaceutical record are by JOHN URI LLOYD.

Treatise No. I embraces Thuja Occidentalis and Crataegus

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. III embraces Pilocarpus (Jaborandi).

Treatise No. IV embraces Veratrum Viride.

**Treatise No. V will embrace Chionanthus (a remedy for Jaundice),
and Ceananthus Crocata (a remedy for Epilepsy).**

Drug Treatise, Number IV.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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Veratrum Viride.

History.—*Veratrum viride* is an American plant, known under the common names Itch-weed, Indian poke, American Hellebore and Swamp Hellebore. (The term Poke Root, early (1785) given, properly belongs to *Phytolacca decandra*.) Found in swampy soil and meadows East and South, and along streams, it is among the earliest swamp plants, often growing with Skunk Cabbage, with which the root is sometimes mixed in commerce. The earliest reference is by the traveler, Josselyn (1672), who (as is also true of others) considered it the European *Veratrum album*. Following, Kalm (1753), Cutler (1785), Schœpf (1787), Aiton (1789), Barton (1798), Bigelow (1818) Thatcher (1821), Rafinesque (1830), and all subsequent American botanists gave it attention, the earlier writers considering it the European *Veratrum album*, to which it is closely related. In 1742 (Loudun) the plant was introduced into Europe, but Aiton (1789) states that to Collinson in 1763 is due the honor. Credit for the name is usually given Aiton, but is really due William Solander, a pupil of Linnæus.

Medical History and Qualities.—*Veratrum viride* was erroneously said to be poisonous to cattle (Kalm), but Maisch considered the leaves innocuous. Frederick V. Coville informs us that sheep in the West fatten on the leaves and stems, and that stockmen call it Wild Indian Corn. Corn steeped in decoction of the rhizome (Cutler) poisons crows. Owing to its emetic qualities the drug is seldom fatal to man, but overdoses are distressingly energetic, and although we have never known a fatal case, *Veratrum* is classed with substances to be used with care. With Professor A. J. Howe, Specific Medicine *Veratrum* was a great favorite, and this preparation has occupied an important position in every modern Eclectic *Materia Medica* and work of practice. To the regular profession the drug was early known (Thacher, Zollicoffer, Bigelow, etc.), but as is true of so many valuable American remedial agents has been much neglected by the Regular school. Its insecticide qualities and its emetic property led to its use by both the Indians and the early American settlers, who used *Veratrum* both in form of ointment and decoction. As has been stated early writers in American medicine knew somewhat of *Veratrum*, but it was reserved for the Eclectic school to establish and maintain this remedy.

Toxicology, Antidotes and Treatment.—(Professor Felter in *Am. Disp.*) Toxic doses of *Veratrum* produce an *exceedingly weak heart-action*, almost indistinguishable, running *pulse*,

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reduced temperature, cold, clammy sweat, extreme retching, and incessant vomiting, dizziness, faintness, failure of sight, pupillary dilatation, complete muscular prostration, slow, shallow breathing, sleepiness, coma, and unconsciousness, with stertorous breathing. The prompt emesis induced by this agent undoubtedly prevents lethal effects. * * * Death from Veratrum is caused by asphyxia. All vaso-motor depressants, and all agents which diminish the vital force, favor the action of Veratrum. Nausea is always the signal for suspension of the administration of the drug. In poisoning by Veratrum, withdrawal of the drug and free stimulation will quickly overcome the depression. Large draughts of warm water may be given to encourage and assist emesis until the stomach has been thoroughly washed out. This should be followed by undiluted whiskey or brandy to check the vomiting. Opium or morphine may be given by mouth or otherwise, ammonia and alcoholics may be used by enema or hypodermatically, and strychnine or digitalis may be given by the latter method. External heat, sinapisms, friction, etc., must be utilized, and, under no circumstances, must the patient

be allowed to rise from the recumbent position, not even to raise the head to vomit.

Description.—The rhizome only is used in medicine. It is of coarse appearance and as found in commerce is always cut, or sliced. The fragments are yellowish, white internally, dark brown externally, and are covered by a mat of coarse yellowish brown rootlets. The root on chewing is slimy, acrid, bitter. The dust excites violent sneezing. If green Veratrum is



VERATRUM VIRIDE.—[American Hellebore]
Natural Size. (Fragment of Dried Root.)

tinctured by insufficient alcohol, a nasty, slimy liquid results. If the amount of alcohol used is enough to overcome this trouble the preparation is deficient in therapeutic value.

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Since the qualities of the drug are not injured by cautious evaporation of the excess of water in the green drug, especially if it be desiccated whole, it should be carefully exsiccated when collected, but not ground until just preliminary to pharmaceutical abstraction. But special study applies to this as well as every other drug.* The writer met with most expensive experiences and serious disappointments while experimenting to establish Veratrum's best condition for making the Specific Medicine and in determining the very best menstruum and most rational method of manipulation to both abstract and retain its desirable qualities. This experimentation covered a period of years.

Constituents and Products.—No constituent representing the full therapeutical qualities of Veratrum has been obtained from the drug. Chemistry, as is also true of most other plants, destroys, creates, and alters, but does not parallel. Structural relationships that exist in the drug may be broken, new substances created, but the natural balance is not maintained by any educt, product or mixture of ultimates. A fallacy is it to even hope that test tube juggling and heroic chemistry have broken out of Veratrum an educt or product to replace a preparation that represents the interstructural ultimates of Veratrum as nature made them and combined them, and on which the entire therapy of the drug has been established. Thirty years ago, when the writer was enthusiastic in the belief that chemical methods could isolate from plants their qualities, and in alkaloidal form could put their virtues into small compass, the study of Veratrum and its irrevocable lesson to the contrary was one of the shocks that came with irresistible force to dispel the illusion. No constituent or created product represented *Veratrum*. All the alkaloidal fragments broken out, these so-called derivatives mixed together are not Veratrum either in structural composition or in therapeutic value. Separated they are fallacies, antagonistic are they in their actions. Mixed they are frauds if viewed as representing the full drug. Let us chiefly consider the record of these questionable Veratrum alkaloids.

In 1835 Osgood attempted, without success, to discover the active principles of Veratrum. Mitchell (1837) also failed, but in 1857 Richardson found a bitter alkaloid that he considered *veratrine*. In 1865 Charles Bullock broke out a resin and two alkaloids which he named *veratroidia* and *viridia*. In 1874 Mitchell announced that *viridia* was *jervine*, once called *barytine*, and in 1876 Bullock announced that his so-called *veratrodia* (discovered 1865) was impure *jervine*,

*The druggist willing to take whatever drug is found in commerce, and who believes pharmacy is a rule-of-thumb study, can supply a large bottle of liquid labeled Veratrum for little money and can help, as can no other man, the physician seeking cheap remedies who believes there is no virtue in medication and no choice in medicines.

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asserting now that jervine was the *only* alkaloid obtainable from *Veratrum viride*. In 1876 Wormley proved to his own satisfaction that *veratrine* is obtained, which was again denied (1877) by Robbins. In 1878 Wright and Luff described five alkaloids, *jervine*, *pseudojervine*, *rubijervine*, *veratralbine*, *veratrine* and *cevadine*. The last in amount larger than the *total* of all the others. In 1890 Pehkschen obtained principally *jervine* with small amounts of *veratroidine*.

Thus discord reigns and as long as different men with different chemicals heroically attack the drug discord is likely to continue. In our opinion these broken out fragments are chemically made derivatives of the *Veratrum* structure, not natural integral parts. The total mixed alkaloidal product of *Veratrum viride*'s interstructural unknowns will no more give the therapeutical action of *Veratrum* than will the alkaloidal unknowns and various products masquerading under the name *aconitine* give the full therapeutical effects of aconite or the chemical ultimates of ergot replace that drug. The less chemistry *Veratrum* receives the better, no acid or alkali can be tolerated. The kindly touch of neutral solvents without other than the momentary touch of heat is absolutely necessary to the production of a representative pharmaceutical preparation.

PHARMACEUTICAL PREPARATIONS.

As early as 1820 the United States Pharmacopœia recognized tincture of *Veratrum viride*. The current issue recognizes both the fluid extract and tincture. Excepting the British Pharmacopœia and Homœopathic works, Europe ignores it altogether. In the Eclectic profession Specific Medicine *Veratrum* is the standard.

Tincture of *Veratrum* is an inferior preparation in regard to its drug value, being a tincture of but about 7 ounces of drug to the pint. It has a brown red color. Dr. Norwood introduced a proprietary tincture of *Veratrum* yet in good repute and much employed under the name "Norwood's *Veratrum*."

Fluid Extract of *Veratrum* should represent the dried drug *minim* to grain (about). Owing to the amount of inert material in dried *Veratrum* (plant dirt) soluble in the menstruum, it is naturally much darker than the tincture. But notwithstanding this fault, it stands inconceivably higher than any so-called chemical product of the drug such as an alkaloid.

Specific Medicine *Veratrum* is the special result of our study of the drug. It embodies the qualities of *Veratrum viride*, when, in our opinion, in its most desirable condition. It represents this standard drug *minim* to grain as worked by means of neutral solvents and by the most kindly method we can devise. We believe

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it exactly parallels the drug minim to grain. It is clean, energetic, stable, and for many years has been a standard with physicians expert in the use of Veratrum. It will mix with water, alcohol, syrup or glycerin. The authorities contributing the therapy of Veratrum to these pages use this preparation only, as is true of thousands of physicians who know the value of Veratrum as a remedy.

REMARKS ON VERATRUM WITH SELECTED CASES.

BY PROFESSOR ARTHUR WEIR SMITH, A. M., M. D.,
Chicago, Ill.

Preliminary.—Tully, in 1852, mentioned Veratrum viride in his Materia Medica, stating that he began its use in 1810 as a narcotic. He afterwards defined it as an *adenagic* (acting on the glandular system), and *erethistic* (acting on the nervous system). This latter word is obsolete, but I think it more comprehensive than the term *deobstruent*, or *alterative*. In the American Dispensatory, 1870, Professor King called attention to the action of gelsemium, taken by mistake by a planter of Mississippi, resulting in alarming symptoms, bespeaking fatal poisoning, from which collapse the patient recovered in a perfectly normal condition. It is this action which restores all the functions of the body from a pathological to a physiological condition to which I wish to apply the word *adenagic*. Of remedies known to exert a curative action in this manner, Tully mentions *sanguinaria*, *lobelia*, *gelsemium*, *phytolacca*, *apocynum*, *colchicum*, and *veratrum viride*.

With the remedy colchicum I have begun with doses of one drop, increasing the quantity every six hours, until seventeen drops were administered in a dose, when the patient, a large and muscular butcher, afflicted with rheumatism, responded. The same method of dosage was employed by the Thomsonians with lobelia, and in a case under my care, lobelia, after its relaxing and emetic effects had passed away, left a man, severely afflicted with colic and fever, in a perfectly normal condition by its *adenagic* action. With such drugs as these that produce alarming symptoms must Veratrum viride be classed when taken in large doses, and we should not, in my opinion, lose sight of the results that follow this heroic method of treatment.

Tully employed Veratrum in large doses, and used it in acute diseases, such as fever and rheumatism, for its *adenagic* effect, the term being recognized as a unity. In his dosage the remedy was to be continued until as much "as a stomach will bear without nausea" had been given (probably about ten drops of Specific Veratrum), by combining the remedy with opium, he allowed larger doses, making its *adenagic* action more complete.

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In the therapy of Veratrum we find that Osgood, in the *American Journal of Medical Sciences*, 1835, acknowledged his indebtedness to Tully, and Osgood gives, as recorded by the influence on himself, the first record of toxic doses of Veratrum viride, as follows:

"Faintness, somnolency, diminution of sight, dilation of the pupils, vertigo, headache, impaired muscular action, hiccough, cold, clammy sweat, small, infrequent and compressible pulse." He adds, "By the exhibition of full dose I have frequently known the pulse, when ranging 76 to 80 in the minute, reduced to 35 or 40, in the course of a few hours. He found that laudanum and brandy were effective in counteracting all the unpleasant symptoms caused by toxic doses of the drug."

That the knowledge of the therapeutic action of Veratrum viride was well advanced at that time is shown in Osgood's essay, and by referring to this aforementioned essay, 1835, I desire to give full credit to Osgood and Tully, regretting that space will not permit me to reproduce much valuable matter therein recorded.

General Remarks.—If Veratrum viride is given in doses of a drop, or the fraction of a drop, we have the effect of a stimulant, and as the remedy is continued at frequent intervals, or the dose increased at intervals of two or three hours, we have a varied phenomena, which is expressed by the terms diaphoretic, sedative, emetic, etc. I prefer one word, adenagic, to express its multiple action in acute inflammatory fevers; nervine, its action in the neuroses; alterative, where we seem to require a depurant or blood purifier; though it is probably a stimulant in all these cases; and is only a dangerous depressant or paralyzer when we go to an extreme and the quantity introduced becomes toxic.

Taking the ground that all diseased conditions are an expression of an impairment of every function of the body it is easier to comprehend that a stimulant action is necessary to bring the impaired nervous power to a normal condition.

We class Veratrum viride as a cardiac and vascular sedative, because in certain doses, repeated at certain intervals, it reduces the pulse beat; but I think the term misleading if the word sedative conveys the idea of a weakening operation.

Specific Adaptability.—In view of the wide applicability of Veratrum we select from a great number of illustrative cases the following to show its specific adaptability:

Anuria.—In anuria from renal congestion, Veratrum corrects the abnormal condition.

Delirium Tremens.—E. A. L., aged 28, extremely violent and pugnacious. Large doses of morphine failed to calm him. Specific Veratrum, 10 gtt., calmed him considerably. Repeated in 30 minutes; fell asleep 10 minutes later. Pulse strong and beating 180, reduced to 80; temperature could not be taken. Awoke after four hours feeling well.—Reny.

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Malignant Diphtheria.—We have no remedy which can be demonstrated a cure for diphtheria. It remains for me to say, however, that Veratrum is one of the most remarkable remedies in this formidable disease. It stimulates the heart, slows the circulation, softens the pulse, tends to overcome congestion in the inflamed area, relieves irritation of the nervous system, increases waste, and tends in general to restore normal function. It must be given with care and the dose regulated so as to accomplish the intention of the prescriber. Its action in diphtheria is probably that of a stimulant, in this way restoring disordered functions, and if we could certainly say that by its use we could ward off paralysis, it would be invaluable. As it is, when we think our patient has weathered the storm, he dies of post-diphtheritic paralysis, often with little or no warning.

Exophthalmic Goitre.—Mrs. B., 20, ophthalmic goitre for one year; no benefit from treatment. When her case came into my care she had the full pulse which calls for Veratrum. Menses were frequent and irregular. She was given R. Specific Veratrum, ʒ i; Specific Gelsemium, ʒ ii; Aqua q. s. ad. ʒ ii. Mix. Sig. One teaspoonful three or four times a day. When two vials had been taken, she was menstruating every day, a constant small discharge. In addition, she was given R. Specific Apocynum, ʒ i; Aqua q. s. ʒ iv. Mix. Sig. One teaspoonful three times a day. Menstruation became normal at once. By the time she had taken four vials of the first medicine the ophthalmic goitre disappeared, and her health has remained good.—*Trowbridge*.

Erysipelas.—Veratrum has proved an excellent remedy, both locally and internally; in that sthenic form of erysipelas characterized by great swelling, and induration, the inflamed surface presenting a dark, livid hue, with little tendency to vesication or suppuration. For external use, we employ a solution containing two to four drachms of Specific Veratrum in four ounces of water. The inflamed surface is kept covered with small pieces of cloth wet in this solution and changed as they become dry. Only one thickness of cloth should be used. For the internal use of the agent in this disease, no cut and dried rule can be formulated, as much will depend on the skill and judgment of the physician in adapting the medicament to the case in hand. Our usual prescription is thirty or forty drops of Specific Veratrum to four ounces of water administered at frequent intervals if there is much febrile disturbance of the circulatory system, and promptly diminishing the dose, or preferably lengthening the interval between doses at the proper juncture.—*William Collins Hatch*.

Hypertrophy of Heart.—Patient 84, farmer; was suffering from heart disease with hypertrophy, following rheumatism. He had grown weaker under digitalis prescribed by his physicians. I was called in consultation, and prescribed Specific Veratrum, and in twelve hours he was much improved, to the surprise of his physician and friends. In ten days he was up and about the town.—*Waite*.

Heart Disease.—Mr. H., aged 25 years, had a frightful pain in the region of the heart; temperature normal, pulse 80, small, wiry, irregular; apex striking the chest wall violently; blowing sounds over the aortic and mitral valves; could not swallow; threatened with suffocation; dryness of the throat. He had inflammatory rheumatism five years ago, which left the heart diseased. Attack brought on by overwork. Gave him ten drops of Specific Veratrum hypodermically, and in half an hour five drops. Hot water bottle to seat of pain; ice in the mouth for thirst. In an hour heart nearly normal; the symptoms greatly relieved; pulse full, soft; mouth moist and could swallow. Pain being somewhat persistent the medicine was continued; gtt. xv. to water ozs. iv.; a teaspoonful every fifteen minutes, and after four doses at longer intervals. The treatment relieved the pain and improved the general condition of the patient.—*Tuckler*.

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Impetigo (of neck and face).—A. W., fat. plethoric. R. Specific Veratrum, Echafolta, aa, $\mathfrak{z}$ i; Aqua dest. q. s. ad. $\mathfrak{z}$. iv. Mix. Sig. Apply on absorbent cotton. Cured after using 12 ounces of this lotion.—*P. F. Bullington.*

Phlebitis.—J. R., robust miner, 26. Phlebitis of right basilic vein. Felt as if section of lead pencil was incased in vein for about six inches midway from axilla to elbow. Appeared about to suppurate. Temp. 102° F.; pulse, full and strong. R. Specific Veratrum, $\mathfrak{z}$ ss; Echafolta, $\mathfrak{z}$ i; Aqua Chloroformi q. s. $\mathfrak{z}$ iv. Mix. Sig. One teaspoonful every hour till fever abates, then every two hours. Also, Specific Veratrum, Echafolta, aa, $\mathfrak{z}$ i; Aqua, $\mathfrak{z}$ ii. Mix. Sig. Apply to arm on absorbent cotton. Patient discharged in four days.—*Bullington.*

Puerperal Convulsions.—Labor normal, but patient excited and nervous. Lower extremities, hands and face bloated. After delivery, gave grs. x of potassium bromide; had a convulsion soon after; rigid from head to foot, frothing at the mouth. Gave one-fourth grain of morphine and inhalations of chloroform. Morphine, chloral hydrate and chloroform used liberally failed after four hours trial; I now gave her gtt. viii Specific Veratrum hypodermically, and in fifteen minutes the pulse fell from 140 to 60, with general relaxation. In two hours gave five minims Veratrum. She had passed no urine in twenty-four hours; there was none in the bladder. Gave bromide of potassium and chloral hydrate. Sixteen hours later she had passed two pints of urine and had no more convulsions. Recovery complete. — *Knapf.*

Veratrum viride is depended on in the treatment of puerperal convulsions by nearly all practitioners at the present time. The quantity that such cases will bear seems incredible. Ten drops of Specific Veratrum given hypodermically and repeated every fifteen minutes till there is evidence of improvement is an approved treatment. Smaller doses do not seem to do any good. Bleeding, chloroform, chloral, gelsemium, lobelia, potassium bromide, elaterium or other remedies have been practically abandoned, and Veratrum in large and frequently repeated doses depended on.

Phthisis.—Prof. J. M. Scudder (E. M. Journal, 1882, p. 569) says of Veratrum in phthisis:

"In the early stages of phthisis Veratrum has a curative action. The marked symptoms are a frequent pulse and high temperature. In proportion as we control these the disease is modified. Veratrum is not a depressant here; it lessens the frequency of the pulse and reduces the temperature, improving every function. It may be combined with arsenic, which in small doses is a vital stimulant. Veratrum relieves the thoracic pain, cough and fever; and with the pulse normal, the appetite good, there is a gain in flesh and strength, the abnormal sounds disappear (blowing sounds at the apex) from the lungs.

"Case. A girl, pulse 120° , a persistent cough, thoracic pain, hectic fever, no appetite, very thin in flesh, evidences of tubercular deposit in apex of left lung, with small, whistling sounds extending to the right lung. After two months treatment the pulse is 90, temperature normal, appetite good, gained six pounds weight, cough much better; whistling rales have passed away and she can walk a mile without trouble."

He says elsewhere (E. M. Jour., 1884, p. 284), "I believe Veratrum is the best vegetable *alterative*. If the deposit is aplastic, tubercular, it is far superior to any. It may be supplemented by the hypophosphites, sulphur in some form, by lime and by arsenic."

The dose is not given, but elsewhere (King's Disp., 1870, Ed. p. 854) Scudder gives his opinions as to the dose of Veratrum and its action.

"It lessens the frequency of the pulse in both large and small doses. In large doses the sedative action is a real depression of life, and the circulation is really

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impaired. Such an action may be temporarily borne in sthenic fever and inflammation, and may be attended with good results. Yet, as it cannot be continued for any considerable length of time, and can only be resorted to in high grades of action, it is better to depend on small doses, which improve innervation through the sympathetic, remove obstructions to the free circulation of the blood, also irritation of the circulatory system, the power of which it increases. Veratrum in small doses gradually lessens the frequency and hardness of the pulse, and promotes a uniform and equal circulation."

Rheumatism.—A young man with a typical attack of acute rheumatism had specific indications for Veratrum viride. He was directed to take drop doses of Specific Veratrum every hour, but by mistake took larger doses, which caused complete relaxation; the pulse was brought down and he vomited freely, throwing up a large quantity of bile. The Veratrum was stopped and his stomach settled, and he was kept warm in bed. As he recovered from the effects of the Veratrum it was found that the fever and all the signs of rheumatism had disappeared and did not return.—*Fearn*.

Prof. A. Jackson Howe says (*Eclectic Medical Journal*, 1885, p. 356), "I have been a champion of Veratrum for twenty-five years. Continued experiences increase its value as I learn to appreciate its therapeutic action, especially in pulmonary and uterine complaints."

From the same authority I collect from an article in the *Chicago Medical Times*, January, 1880, further testimony.

"Veratrum slows the heart's action and respiration, softens a wiry pulse, moistens the skin, mitigates the distress of fever, and does not dull the appetite. It is emphatically the best remedy in pneumonia, pleurisy and respiratory troubles in general. Veratrum helps to harmonize the movements of the heart and lungs when they are acting abnormally. In acute influenza Veratrum is the remedy par excellence. Veratrum covers more morbid conditions than any other medicinal agent I know of. In obstetric practice I like Veratrum, and in operative gynecology; in dysmenorrhea, metritis and ovaritis; in hemorrhages and febrile onsets of phthisis, and in congestive states generally, Veratrum is emphatically indicated. In drop doses it is decidedly antithermic, and an equalizer of capillary and vaso-motor action. It stimulates a sluggish lymphatic state of the body, and promotes assimilation. In the incipient stage of phthisis, Veratrum is invaluable. It provokes an appetite, lessens cough, and subdues febrile paroxysms. The nutritive system is directly benefitted by the action of Veratrum. It improves the mesenteric lymphatic, and nutritive activities generally. Drop doses of Specific Veratrum (the full dose) must be given every two or three hours."

He also recommended drop doses of Specific Veratrum every two or three hours in diphtheria, bathing the upper part of the body with dilute tincture of Thuja every two hours.

Prof. A. L. Clarke, M. D., considers Veratrum viride as a better alternative in syphilis than any other. He gives four or five drops of the tincture three times a day, or as the stomach will bear.

The late Prof. J. M. Scudder favored the small dose of Veratr. m. (*Specific Medication*, 1870, ed.) "It lessens the frequency of the pulse, removes obstruction to the free circulation of the blood, and gives slowness, regularity, freedom and an equal circulation in all parts of the body. The remedy should be used in small doses frequently repeated, in order to get this action, and not in one large dose, as the latter causes depression. The single large dose paralyzes the cardiac nerves, impairs the circulation and causes congestion, producing irritation of the stomach, and cannot be tolerated. The best dose is a fraction of a drop to three

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drops (of a tincture half the strength of the Specific Medicine). In small doses it stimulates the vegetative functions, acts on the sympathetic and ganglionic system of nerves, removes obstructions to the capillary circulation, gives tone to the vascular system and strength to the heart. Veratrum is the remedy for sthenia, where there is a frequent but free circulation; where there is an active capillary circulation both in fever and inflammation. A full and bounding pulse, a full and hard pulse, and a corded and wiry pulse, if associated with inflammation of serous tissue, Veratrum will cure inflammation wherever located, just as it does fever, but the action is not so pronounced. Locally applied, Veratrum will arrest superficial inflammation if applied early, as in case of erysipelas and phlegmonous inflammation; felons, ostitis, tonsillitis, etc. In chronic diseases Veratrum stimulates the vegetative processes, lessens the frequency of the pulse, gives a free and uniform circulation, lessens temperature, increases waste and excretion, and finally it stimulates digestion and nutrition."

Asiatic Cholera.—As a stimulant, Dr. Frost (*Med. Tribune*, 1879, p. 117) claimed that the fraction of a drop was effective in the collapse of Asiatic cholera, while Prof. Paul W. Allen instanced a case of diphtheria in a pulseless state in which Veratrum was given and recovery followed. He believed it antidoted the blood poisons of diphtheria, erysipelas and zymotic diseases.

If we examine with care cases reported, I think it will be found that we must give up certain time-honored doctrines in order to comprehend the therapeutic action of Veratrum viride. What bearing has the doctrine of sthenia in adynamic diseases, such as typhoid fever, puerperal septicaemia, malignant scarlet fever or diphtheria? Clearly we must seek some other explanation than that it acts as a sedative or its synonym, depressant, in these cases. It is here that the term adenagic comes to our aid. The condition in disease is one of disordered function, and in the diseases named the tendency is to putridity, while the action of the remedy is to stimulate antiseptis to the poisons of the system by restoring normal action.

The varied opinions for and against Veratrum viride as a therapeutic agent appear to grow out of the different ideas which prevail as regards the dose. To obtain the best results we cannot adopt a standard dose as one drop of Specific Veratrum every hour. The dose must be selected according to the nature of the case and the diathesis of the patient. If we are governed too enthusiastically by the physiological action or the chemical analysis of the drug, or certain doubtful pathological doctrines, we will be likely to fail. We must be willing to be guided by practical experience. As seen from the cases reported in this paper, the quantity of the medicine, the frequency of its administration, and the limit of its action must be left to the judgment of the physician in charge of the case. When the remedy is doing good, in acute diseases, the symptoms will improve within twenty-four hours. If there is a full and bounding pulse, it becomes slowed; or if wiry, it becomes soft; or if weak, strong; the high temperature is reduced, and all the unfavorable symptoms yield. There are cases where the adenagic action of the remedy should be invoked, and others when the gentler action of the drug is sought.

THERAPY AND SPECIFIC USES OF VERATRUM.

Revised from Article on Veratrum in America Dispensatory (Felter and Lloyd),
By H. W. FELTER, M. D., Cincinnati, Ohio.

Medical Uses and Dosage.—American Hellebore exerts an influence upon the system quite similar to that of White Hellebore (*Veratrum album*, which see). Veratrine does not represent the action of this plant, which contains but a small proportion of this body. Applied to the skin, Veratrum is rubefacient, and

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to the nose, excites sneezing. ⁴ Small doses of Veratrum appear, at first, not to affect the frequency of the pulse, but to lower its force; it afterward slows the pulse, it becoming moderately full and soft, and remaining so, unless the patient, during this stage of depression, attempts to rise or makes any exertion, when the pulse becomes very rapid, small, thready, and sometimes almost imperceptible. During the stage of depression there is marked muscular weakness and relaxation, and nausea and vomiting take place, the contents of the stomach being evacuated first, and then those of the gall-bladder. Occasionally, a watery diarrhœa is caused by Veratrum, sometimes amounting to hypercatharsis, but, as a rule, purging is not produced. The nausea produced by Veratrum is intense, and the vomiting severe and often persistent, making it, therefore, an unsafe emetic. The most characteristic action of Veratrum is its effects upon the movements of the heart and upon vascular tonus. The pulse-rate has been lowered to 35 beats a minute with this agent, a corresponding depression of force accompanying this action. When such depression is reached it is seldom that emesis can be prevented.

Therapy.—Therapeutically, Veratrum is a remedy of great value and power, though quite transient in its effects. Small doses do good work when indicated, but they must follow each other at short intervals, so that a continuous action may be kept up. Owing to its tendency to induce gastric irritability, with nausea, large doses are not tolerated (except in puerperal eclampsia), and even small doses are contra-indicated when the tongue becomes long and pointed and reddened at the tip, and nausea and other unpleasant gastric phenomena are present. Veratrum increases secretion from the lungs, kidneys, and liver, but depresses the circulatory system. It is not adapted to asthenic troubles, but proves an admirable remedy in *sthenic conditions*, with the full, bounding pulse. Early in the nineteenth century, Prof. Tully called attention to the value of Veratrum in *gout, rheumatism*, etc., declaring it equal, if not superior, to colchicum. Dr. Osgood (1835) affirmed it to be an excellent agent in all diseases in which it is required to diminish the activity of the heart and arteries, and his observations have been subsequently confirmed. It not only lessens excited cardiac action, but lessens temperature and restores suppressed secretions. (For Norwood's account of the action of Veratrum, see *American Dispensatory*, 17th and preceding editions.)

Veratrum is a positive arterial sedative in *sthenic inflammations and fevers*, when not contra-indicated by gastric irritability. The popularity of Veratrum, as a specific agent, is due most largely to the writings of Prof. J. M. Scudder, M. D., who believed that Veratrum was preferable to aconite in *sthenic diseases, high grades of fever, pulmonary and other active inflammations*. He declared it the remedy when there is a frequent, but free, action of the heart, where there is active capillary circulation, and in *serous inflammations*, when there is a full and hard pulse, a full and bounding pulse, or a corded or wiry pulse. In *determination of blood to the brain*, and in *active delirium*, he employed Veratrum in conjunction with gelsemium. He also found it of service where it was desirable to increase the action of the excretory organs. He says of Veratrum: "It lessens the frequency of the pulse in both large and small doses. In large doses the sedative action is a real depression of life and the circulation is really impaired. Such an action may be temporarily borne in sthenic fevers and inflammation, and may be attended with good results. Yet, as it can not be continued for any considerable length of time, and can only be resorted to in high grades of action, it is better to depend upon small doses, which improve innervation through the sympathetic, remove obstructions to the free circulation of blood, also irritability of the circulatory system, the power of which it increases. Veratrum, in small doses, gradually lessens the frequency and hardness of the pulse and promotes a uniform and equal circulation."

VERATRUM VIRIDE.

Prof. Scudder further says of Veratrum (*Specific Medication*, pp. 262-63): "In small doses, Veratrum is a stimulant to all the vegetative processes. Acting through the sympathetic or ganglionic system of nerves it removes obstruction to the capillary circulation, gives tone to the vascular system and strength to the heart. As the obstacles to a free circulation are removed, and the vessels through which the blood is distributed and returned, regain their normal condition there is less necessity for increased action upon part of the heart, and, as the power of the heart is increased, there is less necessity for frequent contraction. I give this as a theory of the action of Veratrum, but whether true or not, there is no question with regard to the facts as above stated."

Veratrum is a remedy for active febrile and inflammatory diseases of the respiratory tract of the sthenic type. In these disorders it moderates the flow of blood, increases secretion, allays nervous irritation, brings down the temperature, and subdues inflammation. The hard, full, bounding pulse is the guide here as elsewhere. Prof. Webster speaks of it as being specially indicated in the early stage of "inflammation of the area of distribution of the bronchial arteries." A gargle of Veratrum is useful in *inflamed sore throat*. All *sthenic inflammations of the throat* are controlled by it. It is an excellent agent in *acute tonsillitis*, when indicated, and often painting the tincture alone upon the tonsils will check the disease. Very small amounts, however, should be used in this manner, and then only in the robust. Veratrum, when indicated by the full, bounding pulse, is an excellent sedative in *acute pneumonia* in the first stage, but only in markedly sthenic cases. The dose should be small and frequently repeated until the temperature and circulation respond, when the pain will be lessened, nervous excitation allayed, secretion re-established and cough controlled. It is equally of value in *pleurisy* (usually with *bryonia*), and in *acute bronchitis*, when specifically used. Veratrum is a valuable expectorant, and is of marked value in *chronic pulmonary affections*, to control the circulation, and thereby regulate the temperature, besides acting as a powerful and efficient alternative. In *phthisis*, especially in the early stage, it controls the violent circulation and temperature, facilitates expectoration, and exerts a beneficial influence over the sympathetic system, controlling restlessness and excitement, and quieting cough. It is very frequently of service in *chronic bronchitis* and in *chronic pneumonia*. It is valuable in *hemoptysis*, when the circulation is strong and violent. Prof. Howe regarded it as one of the best alternatives that could be used in chronic lung troubles, being especially valuable in *pulmonary consumption* for this, and for the control of the inflammatory condition.

When indicated, Veratrum is a remedy of great power in *peritonitis*, especially *puerperal peritonitis* and *pelvic peritonitis*, from septic absorption. Here the inflammation must be speedily checked and quite large doses may be required—two to ten drops of Specific Veratrum may be given every half hour (if it does not provoke nausea), and continued until sedation is effected, when the remedy may be continued in fractional doses. Veratrum has won laurels in *peritoneal inflammations*. It is also a remedy of importance in properly selected cases of *nephritis*, *cystitis*, *hepatitis*, *ovaritis* and *orchitis*. For inflammations arising from blows or kicks upon the abdomen it is the best known remedy. It is often useful in active forms of *acute gonorrhœa* and may prevent *chordee*, and, in *acute inflammatory rheumatism*, it may be given to control pain and promote elimination. Veratrum has been justly praised as a remedy for *erysipelas*. It may be used both topically and internally. It is adapted to that form showing tumefaction and redness, simulating ordinary inflammations. It has been successfully used, internally and locally, for the relief of *poisoning by Rhus Toxicodendron*. Boils, *carbuncles*, *inflamed pimples*, *felons*, *ulcers*, with heat and tumefaction, cellular

VERATRUM VIRIDE.

inflammations and *labial herpes* are well treated by painting Specific Veratrum upon them.

Prof. A. J. Howe stated that, "as an alterative, Veratrum viride takes a high rank. It improves the appetite and favors assimilation by exciting to action the lacteals and lymphatic system generally. In *scrofula*, *constitutional syphilis*, *cancer* and *tetter* it can be employed as an internal remedy to great advantage. It tends to correct the menstrual function, restraining a too frequent and profuse flow, and exciting to greater activity a scanty and tardy menstruation." Veratrum is a useful agent in some nervous disorders. "It relieves irritation of the nervous system by lessening the momentum of blood to and through the nerve centers" (Scudder). When *convulsive disorders* depend upon an excited circulation it proves a powerful remedy. Few remedies have been more praised than Veratrum in *puerperal eclampsia*. There is marked cerebral engorgement and the indications for Veratrum must be present, as in other disorders, for one to get good results from this agent. The dose must be quite large and be regulated according to the sedation produced. "We have given as high as forty drops every hour for three days to control puerperal eclampsia for which it is the best remedy" (Felter). It is of value in other forms of convulsions, especially in undue *excitement of the spinal nervous system*, in *spinal irritation*, *spinal convulsions*, *cerebro-spinal meningitis*, and *acute mania*, all with excited circulation. When *neuralgia* and *headache* are due to irritation of the nerve centers, with hyperemia, it proves a useful drug; usually, however, it is of little value in headache, unless accompanied with elevation of temperature. "It will restore quiet and allow sleep in *delirium tremens*, when the pulse is full and bounding, and the eyes red and bloodshot, with evidence of inflammation" (Locke).

Beginning with small doses, and progressively increasing to twelve drops of Specific Veratrum, and again reducing the dose, Veratrum has been accredited with favorably influencing *exophthalmic goitre*. Veratrum has been given with digitalis in the early stage of *dropsy*, where there is rapid heart-action and a sedative is required. It is a good remedy in *aneurism* to retard the velocity of the blood-current and to reduce the vaso-motor tonus. *Heart disorders* are often relieved by it. Thus it controls *palpitation*, with violent circulation, and especially the irritable heart, produced by the use of tobacco. Palpitation, due to *cardiac hypertrophy*, is quieted by it, when valvular incompetence is not a factor. "In these cases the pulse is full, strong and intense, the carotids pulsate forcibly, the eyes are bloodshot, and there is cough, headache, and weight in the upper epigastrium, while the heart may beat so violently as to shake the bed, and sleep is entirely prevented. This remedy relieves the excitement, the heart-action becomes normal, the cough improves, and the patient is in every way better" (Locke). The dose for this purpose is one drop, in water, five or six times a day.

Prof. Foltz (*Dynam. Therap.*) always employs Veratrum after cataract operations, and uses, locally, for *mastoid disease*, the following: R. Aconite, Veratrum, aa, $\text{℥} \frac{3}{4}$ ii to $\text{℥} \frac{3}{4}$ iv; aqua, $\text{℥} \frac{3}{4}$ iv. Mix. The dose of tincture Veratrum is from one to ten drops (gradually increased until some effect is produced), every two, three or four hours; of the extract, or inspissated juice (both of which are seldom used) $\frac{1}{4}$ grain, carefully increased as required; of the powdered root (seldom used), from four to ten grain doses; of fluid extract, from a fraction of a minim to five minims; of Specific Veratrum, the best preparation, from a fraction of a minim to fifteen minims.

Specific Indications and Uses.—Pulse frequent and full; tissues full, not shrunken; surface flushed with blood; pulse rapid, bounding; pulse rapid, full, corded, or wiry; marked arterial throbbing; increased arterial tension, with bloodshot eyes; sthenic fevers and inflammations; erysipelas, appearing like

VERATRUM VIRIDE.

ordinary inflammation; red stripe along center of tongue; irritation of nerve centers, due to an excited circulation; convulsions from active, cerebral hyperemia.

"Carotids pulsating forcibly with cough, headache, and weight in the epigastrium; full pulse and rapid action of the heart preventing sleep" (Fyfe, *Essentials of Modern Materia Medica and Therapeutics*).

For the guidance of physicians Specific Veratrum bears the following label and therapeutic note.

SPECIFIC VERATRUM.

This remedy is employed to *slow* the pulse, and is especially indicated when it is full and strong, the *large* pulse being the prominent feature. The deep red stripe down the center of the tongue—marked—is a characteristic symptom, and calls for Veratrum. Fullness of tissue—not contraction—is found in cases where Veratrum gives its best results. It is a remedy in erysipelas with full tissue and bright color, both locally and internally, and in chronic disease with full pulse and increased temperature.

Following the indications given, Veratrum has had a deserved reputation in puerperal convulsions and puerperal fever. There is no doubt that Veratrum has a decided influence for good in phthisis pulmonalis, and if given during the incipient stage as an intercurrent remedy, as advised by Prof. Howe, may assist in the cure of curable cases, and will meet many of the unpleasant conditions in the incurable cases.

Indications.—The full, strong, frequent pulse, surface flushed.

Use.—Lessens the frequency of the heart's action, and removes obstruction to the circulation. The remedy for *sthenic* fever and inflammation. A remedy in erysipelas, used internally and locally.

Dose.—R. Veratrum, gtts. v to xx.

Water, ℥ iv.

M. Sig.—A teaspoonful of the dilution every hour.

VERATRUM VIRIDE.

MATERIA MEDICA STUDIES.

The accompanying treatise is part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of Materia Medica, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressively for these fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional.

The history, description, pharmacy and chemistry will be written by John Uri Lloyd.

Back numbers of these studies will be supplied physicians and pharmacists, on application, as long as they are in print; but, as we make no remedial agents for the public, and are opposed to the encouragement of self-medication by the people, we can not supply them to persons outside the professions.

Veratrum viride, the subject of this treatise, is one of the most useful remedies of the Materia Medica, but its value depends on its prompt and certain action. For this reason physicians can appreciate the necessity of a preparation that in small doses is as sure as the Specific Medicine, which, although established over a quarter of a century, may not be known to all readers of this fascicle.

The next fascicle (Drug Study No. V) will embrace the invaluable remedy *Chionanthus*, one of the most celebrated known remedies for jaundice, and the energetic drug *Ceanothus Crocata*, a remedy in the treatment of epilepsy.

PRICES OF VERATRUM VIRIDE PREPARATION.

Specific Medicine Veratrum Viride.

¼-lb. Package	60c. each.	By mail, 82c. each.
½-lb. "	\$1.15 "	Not mailable.
1-lb. "	2.25 "	Not mailable.

For sale by Pharmacists generally and by all Wholesale
Druggists of America

FEBRUARY 1, 1904.

LLOYD BROTHERS, Cincinnati.

A TREATISE

ON

Chionanthus Virginica.

The Therapeutic Uses are written for this Treatise by **FLOR-
ENCE TIPPETT DUVALL, M. D.,** Atlanta, Ga.

The Reproductions are the original article on Chionanthus by
I. J. M. GOSS, M. D. (the discover of the uses of Chionanthus), and
reprints of articles by

J. C. ELLIS, M. D.,	A. P. HAUSS, M. D.,
W. N. MUNDY, M. D.,	J. P. HARVILL, M. D.,
B. L. SIMMONS, M. D.,	J. C. ANDREWS, M. D.,
G. W. BOSKOWITZ, M. D.,	F. C. GALE, M. D.,

and an Editorial in the Eclectic Medical Journal.

The Illustration is drawn from the drug, for this Treatise, by
MR. W. F. HAMMER.

The Description, History, Chemistry and Pharmaceutical
Record are by **JOHN URI LLOYD.**

Treatise No. I embraces Thuja Occidentalis.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. III embraces Pilocarpus (Jaborandi).

Treatise No. IV embraces Veratrum Viride.

Treatise No. V embraces Chionanthus Virginica.

Treatise No. VI will embrace Asepsin and Asepsin Soap.

Drug Treatise, Number V.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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Chionanthus Virginica.

(FRINGE TREE.)

Common Names.—Fringe Tree, Snow Flower, Snowdrop Tree, White Ash, Old Man's Beard, Old Man's Grey Beard. (Illogically called *Poison Ash*.)

History.—This tree is abundant in moist elevated places in the Central South, being very plentiful in Georgia and Tennessee. The flowers are snow white, hence the name *Snow Flower*, which also indicates the Greek derivation of the word, *Chion* (snow) and *anthus* (flower); the correct pronunciation being kí ō-năn-thūs. There is no record of the Indians using it as a remedy.

In *Chionanthus* we have the example of a remedy introduced for one purpose, and finally established for another markedly distinct purpose. Rafinesque (1830) gives it the value "febrifuge in ague and chronic fevers. Externally in cataplasms it cures wounds without supuration." King's American Dispensatory following the first edition commended *Chionanthus* principally as useful in *fevers*, especially *obstinate intermittents*. More effective remedies, however, altogether displaced it from that field where it is now obsolete. The credit of its introduction into its present field is due to Professor I. J. M. Goss, M. D., an Eclectic physician of Marietta, Ga., who in 1843 successfully used a preparation of the bark of the root for an attack of jaundice, from which he personally suffered. [See p. 8 for the original article on *Chionanthus* by Dr. Goss, as published in his "New Materia Medica and Therapeutics," 1877.] Professor Goss employed the remedy in practice, introduced it to his professional friends, and commended it freely in the journals as well as in his book publications. The remedy proved so successful as to come into repute at once in Eclectic practice, to which for a couple of decades it was almost exclusively confined. Finally its reputation crept outside, the drug being moderately used by Regular physicians who read contemporary medical literature, but, as yet, this important remedy has escaped the attention of the leaders in Regular Therapy. This is to be regretted for the drug would be of much use and greatly serve humanity were it extended in that direction.

Chionanthus is unquestionably one of the most valuable of the Eclectic remedies when the Specific Medicine is administered in accordance with modern Specific Medication methods. It has no reported poisonous qualities.

CHIONANTHUS.

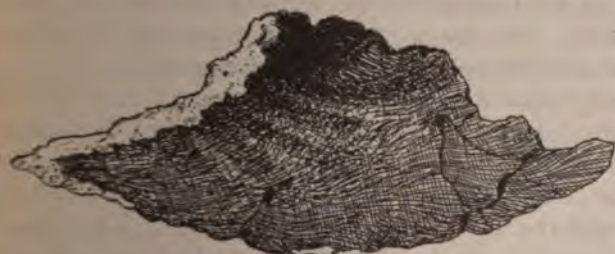
Part Used.—The inner bark of the root. It stands somewhat conspicuous in that the commercial drug is always true to name, no sophisticant or substitute to our knowledge being found on the market.

Characteristics and Constituents.—Chionanthus root-bark is brown externally, presenting a light yellowish color when the dried bark is broken. It is hard, brittle, and destitute of fiber. The odor is characteristic, rank and peculiar. The writer can not locate a drug that possesses a similar odor. When the dried bark is

soaked for twenty-four hours in cold water it swells to its natural size, becomes white, and when broken presents a spongy, fleshy fracture;

through the white flesh are seen deposits of a hard, gritty, yellow, amber-like, semi-transparent substance, which lies in pockets parallel with the grain of the tree. This material is nearly tasteless, and is desti-

tute of medicinal value. The taste of Chionanthus bark is bitter, and, dominated by the odor, gives a very characteristic flavor when the bark is chewed. No analysis of the



CHIONANTHUS VIRGINICA.
[Dried Bark of Root—Natural Size.]

bark has been made, attempts to do so having failed for obvious reasons. Mr. R. S. Justice thought to have identified saponin, which Mr. W. von Schulz disputed, in his turn announcing a glucoside. The fact is, the most tender touches of chemistry disrupt the drug, which is so sensitive that its alcoholic tinctures and fluid extracts disintegrate and fly into unknown products even when kept in the cold. No known separated constituent gives the energy of Chionanthus. The so-called *Chionanthin* of early Eclecticism was intended to be a mixture of about everything the drug afforded. In its production, heat, dessication and heroic destructive manipulation, brushed the life out of the drug, the product, a so-called concentration or resinoid

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of the resinoid and alkaloid craze of Eclecticism's infancy, being practically valueless. The writer of this paper has made a systematic study of Chionanthus for twenty-five years. It has been to him a perplexing problem, one of the most exasperating in some regards of all the Materia Medica drugs. The experimental details of this work would fill a volume. Be it enough to state that as a conclusion we believe the only possible therapeutical representative of the bark to be a liquid pharmaceutical preparation. Practically no heat, no chemistry, no heroic disruption methods, no acid nor alkaline solvents, can be employed in its production. The drug must be of exceptional quality, fresh and prime. The kindest touch of perfectly neutral solvents is an absolute necessity to success. Destructive chemistry is a mockery.

PHARMACEUTICAL PREPARATIONS.

These are prone to gelatinize after the manner of certain pectin solutions, e. g. Senega. The substance that forms this Chionanthus jelly is not, however, pectin, although it may possibly be related thereto. It is an altered product, not present in the bark, and is peculiarly a Chionanthus derivative. It is neither soluble in alkaline solution, alcohol, glycerin, water, nor the original menstruum used in extracting the drug, resembling more closely the gelatinous decomposition products of solutions of Nettle Root (*Urtica Dioica*) than any other substance. For many years this gelatinous disturber worried the writer inconceivably. It was likely to appear in alcoholic and in aqueous preparations, glycerin and sugar did not prevent it from forming, nor did any mixture of solvents protect the preparation. The very best liquid representatives of the very best quality of drug were prone to alter, and, indeed, seemed fully as inclined to disintegration as did the poorer fluids of commerce. This exasperating feature of the Chionanthus liquids annoyed physicians very much, for a representative, nice preparation might gradually deposit a thick semi-transparent jelly to the extent of half its bulk, or might, indeed, in a single night, become gelatinous. True, preparations that would remain permanent could be made, but so can the play of Hamlet be given with Hamlet left out. Only the past year did the writer determine the cause of the trouble and perfect a process that, as shown by the *Specific Medicine 1904*, is crowned with fair success. The only pharmaceutical preparation we commend as carrying the full value of Chionanthus Root Bark, minim to grain, is therefore:—

Specific Medicine Chionanthus 1904.—This liquid is made from the recent bark of Chionanthus Root in its best form. *It possesses a bitter taste, and imparts to water the exact flavor of*

CHIONANTHUS.

the drug, but itself is nearly odorless. It has a red-yellow color, and when poured into water yields a light colored flocculent precipitate. Each minim carries the full value of a grain of the bark. It is practically permanent, there being no indication of the preparation made by the 1904 formula gelatinizing or altering, other than when long kept, forming a slight coating on the bottom of the bottle. It is the only preparation of Chionanthus known to us that carries the full qualities of the drug in a satisfactory form, and as has been said, is the only preparation we commend. It will be observed that the authorities contributing the therapy of Chionanthus to this fascicle base their statements on the use of the Specific Medicine.

THE THERAPEUTICS OF CHIONANTHUS VIRGINICA.

PROFESSOR FLORENCE TIPPETT DUVAL, M. D., Atlanta, Ga.

Among the drugs which Eclectics consider particularly the product of the Eclectic school of practice, Chionanthus Virginica holds a conspicuous place.

In the early 70's Professor I. J. M. Goss, M. D., recorded his experiences with Chionanthus (Old Man's Beard, as it is familiarly known in the South) in chronic hepatitis, and acute catarrhal conditions of the liver. From his continued administration of the drug, he developed a line of indications which later-day Materia Medicists give as follows: "Acute jaundice, evidenced by yellowness of the conjunctiva, first; subsequently of the skin, with distress in the right hypochondrium, with cramp-like pains." (*Ellingwood*.) "Skin resembling copper in color, but shading a little more on green; pain in the epigastrium and right hypochondrium, yellowish or greenish discoloration of the eyes." (*Fyfe*.) "The special action of this drug is expended upon the liver and to some extent on all the organs concerned in blood-making. It is tonic to the stomach and bowels, and influences the whole glandular apparatus. It is one of our best cholagogues, and we have employed it with good results in jaundice and congestion of the liver. Yellowness of the conjunctiva and skin, uneasy sensations in the right hypogastrium, and extensive abdominal pain, somewhat resembling colic, are the specific indications for its use. It may, therefore, be employed in cases of gallstones, during both their formation and passage, hepatic inflammation (acute and chronic), bilious colic, and for the irritable condition of the liver common in the inebriate." (*Locke's Materia Medica and Therapeutics*.)

I regard Chionanthus as one of the most meritorious remedies in our *Materia Medica*. In that insidious and intractable malady,

CHIONANTHUS.

Jaundice, Chionanthus is the main-stay, and will not disappoint when properly administered. Unlike podophyllum, it can be given in good-sized doses and continued for an indefinite period unaccompanied by any unpleasant results. It does not produce nausea, nor does it cause a temporary paresis of the bowels, as is a common sequence of some other cholagogue remedies. It has been declared by some authorities, to be slightly narcotic when taken for some length of time, but in a constant use of the remedy for several years, I have yet to discover any such property. In those cases of chronic jaundice; due to catarrhal affection of the bile duct, Chionanthus is to be depended upon; and while its use is depreciated as being slow, I regard that property as one of great importance. Too often we are tempted to produce sudden and violent stimulation of the liver by more active remedies, whose action is followed by partial suspension of the functions of that organ, the last state of the patient being worse than the first. In these cases iris or podophyllum may be used as adjunct or co-operative remedies in the commencement of the treatment, but their long-continued use is to be condemned. Chionanthus forms a valuable addition to the armamentarium of the obstetrician. Jaundice, that annoying and obstinate trouble of the pregnant woman, disappears before the kindly action of the Fringe tree when it is given in five-drop doses three or four times a day. Infantile jaundice, which so often presents itself and demands prompt attention, is soon overcome by this gentle yet effective remedy. I usually employ it in such cases, triturated with sugar of milk.

Ellingwood says (*Materia Medica*, p. 395):

"It (Chionanthus) overcomes catarrh, liquefies the bile, prevents the formation of calculi, and promotes the discharge of those formed."

I have under treatment, at present, a case of biliary calculi which had defied all previous treatment. Alternate constipation and attacks of hepatitis were the leading features of the case. The patient has been upon -

R Specific Medicine, Chionanthus, - - - - - $\bar{3}$ ij
 Specific Medicine, Nux Vomica, - - - - - gtt. x
 Glycerin,
 Aqua Para, - - - - - aa. q. s. $\bar{3}$ iv
 M. Sig. One teaspoonful four times a day, four hours apart.

In the two months in which this medication has been carried out, the bowels have moved regularly, no congestive attacks have appeared and the patient has gained in flesh and strength.

I have been much impressed by the action of Chionanthus in *chronic kidney lesions* and was glad to see the following by Dr. A.

CHIONANTHUS.

P. Hauss (National Eclectic Transactions, Vol. XXIX): "It is clear in my mind that the malady (diabetes mellitus) should be treated as strictly a functional disease of the liver, giving due attention to the impaired condition of the sympathetic nervous system . . . To correct any functional diseases of the liver with the symptoms given later, I think first of Lloyd's Specific Medicine, Chionanthus. You may ask what is my specific indication for Specific Chionanthus, and I would invariably say, a functional disorder of the liver with the following symptoms, namely: Intense thirst, specific gravity of the urine, 1030 to 1040; frequent and copious urination, more or less nervous prostration, loss of weight, night sweats, and in a large percent. of cases, constipation and stool void of bile, being white in color. I recommend this special drug because I have prescribed it for the last twenty-one years in a large practice, where the above indications were often present, denoting marked functional disorders of the liver."

I have seen numbers of so-called kidney lesions improve under the administration of this energetic remedy, when there were present the indications calling for its administration. Dr. J. P. Harvill (Georgia Eclectic Medical Journal) recommends Chionanthus as a valuable agent in asthma, citing those cases where this affection is accompanied by evidences of hepatic congestion.

Dr. W. M. Durham, a Southern practitioner of many years' experience, is an advocate of Chionanthus in cirrhosis of the liver and in hepatic engorgement from deficient portal circulation. This remedy is a favorite with Dr. Durham as a tonic during convalescence from fevers and in exhausting diseases.

The American Dispensatory recommends the topical use of this agent as a poultice in ulcers, wounds and open sores, and speaks as follows concerning its field of usefulness:

Hypertrophy of the liver, chronic hepatic inflammation, and portal congestion, are speedily relieved by Chionanthus. The remedy acts quickly, often removing in from one to two weeks an icteric hue that has existed for months, and even years. Jaundice once cured by it is not apt to recur. There are two direct indications for the drug: jaundice, as evidenced by the yellowness of the skin, and conjunctiva; and soreness and pain, "hepatic colic," as pointed out by Professor Scudder. The latter is by far the most direct indication. There is the dull, heavy pain in the right hypochondrium, with a feeling of fulness and weight, deep-seated tenderness and soreness on pressure, occasional hectic flushes, light-colored feces, sometimes diarrhoea with frothy, yeasty stools, and urine scanty and high colored.

These conditions, with the icteric hue of skin and conjunctiva, call for Chionanthus. Sometimes the patient writhes in pain—cannot find rest in any position. R. Specific Chionanthus, gtt. x, every half hour, and apply a cloth wrung out of hot water. In *dyspepsia*, with hepatic complications; in *irritative states of the*

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stomach from "high living," and the use of alcoholic stimulants; and in *general chronic inflammatory conditions of the duodenum* and *ductus communis choledochus*, Chionanthus serves a useful purpose. It is also a good remedy in *infantile dyspepsia*, *rheumatic affections*, with soreness in the region of the liver, and a jaundiced condition. Its tonic effects on the chylopoietic viscera render it a good agent in *general debility*. In *intestinal dyspepsia*, with jaundice, thin, watery, yeasty alvine discharges, with previous abdominal distention: R. Specific Chionanthus, gtt. v, every two hours.

Chronic splenitis and *nephritis* are conditions in which Fringe tree often proves a good remedy; also in pancreatic disease, inflammatory or otherwise. *Glandular diseases*, with evidence of imperfect waste, often call for its administration. Chionanthus is of utility in *uterine and ovarian congestion*, when the usual hepatic symptoms calling for it are present. If there be fullness and bearing down in the pelvic viscera, especially a desire to frequently evacuate the rectum, combine it with Specific Helonias.

R. Specific Chionanthus,
 Specific Helonias, - - - - - aa. ʒ j
 Aqua, - - - - - q. s. ʒ iv
 M. Sig. Teaspoonful every two hours.

Chionanthus is a favorite agent of mine in tonic mixtures, where a gentle stimulant to the liver is desired. *Enonymus Atropurpureus*, *Nux Vomica*, and *Hydrastis Canadensis* are co-operative agents of great value in this connection.

I have found Chionanthus an assistant remedy of *Phytolacca*, *Fucus* and *Iris Versicolor* in the treatment of obesity, and believe that it is destined to occupy a wider field of usefulness than that in which it is now established.

Original Article by Dr. Goss Introducing Chionanthus,

From his "New Materia Medica and Therapeutics," 1877.

Some thirty-two years ago, by mere accident, I was led to test the tonic and cholagogue powers of this humble shrub. I had been very badly salivated by my preceptor in the treatment of an attack of simple bilious or intermittent fever, which resulted in an attack of jaundice, for which I was again salivated several times, with the result of an increase of the jaundice. I now was given up to die, for I had tried six or eight of the best physicians of Georgia. Their remedies were the same, mercurials, which only increased the disease. So I had, after trying mercury for four or five months, given up in despair. About this time I was induced by a fellow student to try the "old women's remedy," Chionanthus (Old Man's Gray Beard, as they called it), which grew plentifully upon the sandy land near Augusta, Georgia, where I was then attending lectures; and as the faculty had utterly failed to cure, or even benefit me, I concluded to try it.

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I procured a small quantity, and made a tincture in gin, and took a table-spoonful before each meal. In a few days my appetite began to improve, and my skin very rapidly cleared, and in some ten days my jaundice was gone; my skin was clear of bilious hue, and I felt like another man. As I found my appetite and digestion improving so much under the use of Chionanthus, I continued its use for several weeks, until I left Augusta and went to Western Georgia, where I could not get it, for it was not known then to regular physicians or druggists; but I had derived so much advantage from it that I determined to investigate its properties thoroughly, and it was not long before an opportunity was presented. I met with many cases of jaundice, and found the remedy so prompt to relieve it, that I published my experience in the *Eclectic Medical Journal* of Philadelphia, since which time I have used it in a great many cases of jaundice and debility connected with the torpidity of the liver. For jaundice it is a specific, and it is an admirable tonic for congestion of the uterus, for which it may be combined with helonias, and may be conjoined with any of the tonics before named.

About the time Hallembek, of Philadelphia, was writing his work on *Materia Medica*, I published my success with this remedy, which was transferred to his work. From time to time after that I called attention to this remedy, and now it is used by most Eclectic and many Homœopathic physicians in all liver affections. It has always proved a specific for jaundice in my hands, and a valuable remedy in hypertrophy and congestion of that organ. It does not seem to act as forcibly upon the secretory function of the liver as some articles of its class, but in all abnormal conditions it seems to have the power to bring back the liver to its normal state. It has a specific influence over that organ in its diseased state, let that morbid condition be what it may. It is not cathartic in its action, but acts more as a tonic to the bowels, liver and stomach, and I think influences the spleen and whole glandular apparatus. In very large doses it has produced ptyalism, which soon passes off after the medicine is discontinued. It not only acts well on the liver, stomach and glandular system, but seems to have a curative effect on some female affections. It is very favorably spoken of by some physicians in congestion and chronic catarrh of the uterus.

After a general review of the literature on the subject of Chionanthus, in a paper contributed to the New York City Eclectic Medical Society, 1892, Professor G. W. Boskowitz, M. D., writes as follows concerning his use of the drug:

"My personal attention was called to Chionanthus many years ago by Pro-

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fessor Charles Larew, M. D., who considered it a much neglected but very powerful remedy. He usually combined it with Euonymus.

"I have many times had occasion to be thankful to Professor Larew for calling my attention to this very useful medicine. For fifteen or more years I have used Chionanthus for that class of troubles for which phodophyllin and calomel compounds are usually prescribed—non-inflammatory liver troubles. I consider it a tonic cholagogue and stomachic indicated in all cases of perverted action of the entire digestive organs. More particularly the liver, especially when the disturbance is caused by over-indulgence, or where there is a history of previous malarial trouble; also in re-current bilious attacks. Ellingwood, in his most excellent work on 'Therapeutics,' says of it that it is alterative aperient, diuretic, tonic, febrifuge, purgative and cholagogue.

"It has a specific influence on the liver. Is a remedy for engorgement of the liver and for jaundice. It is cholagogue cathartic in full doses, but its best influence is in acute congestion with imperfect discharge of bile or catarrh of the common bile duct.

"The indications are: Acute jaundice evidenced by yellowness of the conjunctiva first, then of the skin; with distress in the right hypochondrium with cramp-like pains in the abdomen.

"It overcomes catarrh, liquifies bile, prevents the formation of calculi, and promotes the discharge of those already formed. It is a remedy for chronic forms of liver disease, but its influence is not so plainly apparent, being much slower in its operations. It is not indicated in jaundice from permanent occlusion of the duct, from impacted gall-stones or foreign and malignant growths. It will quickly overcome the jaundice of childhood and infancy, and of pregnant women.

"In prescribing this drug I use the Specific Medicine, in doses of from three to five minims every three hours. Specific indications: Clay-colored stools, high colored urine, tenderness and pain in the region of the liver."

Chionanthus in the Treatment of Diabetes Mellitus.—Diabetes mellitus is a condition characterized by a copious secretion of urine charged with sugar, and due to some as yet imperfectly understood derangement of the glyco-genic and glyco-destructive function of the organism.

It is not my desire to dwell long on the etiology and pathology of diabetes mellitus. There are no diseases concurring where so much accurate knowledge has been arrived at, and yet of the true pathology of which we are so thoroughly in the dark. It is not a kidney disease, as was once supposed in its early history, although this impression still prevails among the laity, and naturally so, because the essential evidence of its existence is found in the urine. We all know that we can produce diabetes in an animal by irritating the floor of the fourth ventricle. There are, however, other parts of the nervous system the irritation of which will produce diabetes.

Noted pathologists claim that autopsies in a large number of the gravest forms of diabetes have failed to discover any lesion whatever. We are inclined to the belief that the nervous system has much to do with the production of diabetes, directly and indirectly, and that the great sympathetic is especially important through its transmission of reflex nervous impulses, regulating, as it does, the contraction or dilatation of the blood vessels.

It is commonly admitted that in experimental glycosuria there is a centrifugal stimulus of the liver from the nervous centers, either through the vaso-motor system or from direct stimulus to the liver cells.

With this brief survey of the etiology of diabetes mellitus, it is clear in my mind that the malady should be treated as strictly a functional disease of the

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liver, giving due attention to the impaired condition of the sympathetic nerve system. As to the treatment, this resolves itself to the dietetic, hygienic and medicinal. Dietetic treatment consists essentially in the elimination from the diet of such articles as are readily convertible into glucose, viz., the carbohydrates, which are familiar to us all.

Next in importance to the dietetic is the hygienic treatment. This consists in providing perfect ventilation, and in bathing and attention to the skin, together with muscular exercises.

The medical treatment is a short one with me, as in all diseases wherein treatment by drugs is relatively inefficient. Diabetes has its full share of reputed remedies, most of which are harmful, much less useful. This can not, however, be said of all drugs. Specific medication and specific remedies have, long ago, taught me a valuable lesson—that the name of any disease counts for naught when we select our remedies. To correct any functional disease of the liver with the symptoms given later, we think first of Specific Chionanthus. You may ask what is my specific indication for Chionanthus, and I would invariably say that our patient had a functional disease of the liver with the following symptoms, namely: Intense thirst; specific gravity of the urine, 1030 to 1040; frequent and copious urination; more or less nervous prostration; loss of weight; night sweats; and, in a large majority of cases, constipation, with stool void of bile, being white or clay colored.

Again, why I recommend this special drug is, that I have prescribed it for the last twenty-one years in a large practice where the above indications were present, denoting marked functional disorders of the liver.

Where there is no febrile condition and nervous depression, Specific Nux Vomica should be combined with Chionanthus. I prescribe Chionanthus in from ten to fifteen drop doses, and the Nux in from one-half to one drop doses, when combined, four times daily. The bowels should be flushed every morning, one hour before breakfast, by drinking one to two pints of hot water, to which should be added one-half to one teaspoonful of sulphate of magnesium; or, what is preferable, one-half to one wineglass of French Lick Pluto water in one pint of hot water. This line of treatment should be continued until the specific gravity of the urine is normal.—*A. P. Hauss, M. D., Chicago Medical Times.*

Asthma Treated Successfully with Chionanthus.—It has not been my custom hitherto to offer my experience to the profession in a general way, because I have never had a disposition to arrive at conclusions on a narrow premise or to offer anything unless, to my mind, fairly well established. But during an experience of eight years I have observed many things that perhaps will benefit others.

The Chionanthus Virginica, or Fringe Tree, has always occupied a prominent place among my therapeutic agents, and my confidence in the remedy grows year by year as I observe its direct and prompt effect, when indicated, in diseases of the human body. The first two or three years of my practice I thought the usefulness of this remedy was wholly confined to acute disease, but not so.

While I have seen its splendid work in many other chronic diseases, I shall only mention results obtained in chronic asthma, or frequent recurring spasmodic asthma. There are many forms of this distressing disease, or symptoms, as the case may be, which I shall not take time to discuss. It may be due, as far as the spasmodic contractions are concerned, to a neurosis which depends upon the existence of a peculiar diathesis. Muscular contraction of the circular muscular fibers of the bronchial tubes is an essential element of the paroxysm, which me-

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chanically narrows the lumen of the tube as a result. Each individual suffering from or subject to asthma is susceptible only to his own peculiar exciting cause, and it has been the custom with physicians to offer such patients little or no encouragement for permanent relief. We visit them during the paroxysms, or sudden manifestations, and perhaps will never give a close examination between the attacks to ascertain the cause in each individual case, if possible. I believe that the causes of asthma are as varied as those of dropsy. When you see dropsy you don't conclude that the chief trouble lies in the part swollen, but at some distant point or some systemic condition.

The reason I have associated Chionanthus with asthma in this article is because I have used it successfully in several persistent cases of asthma, all of which were decidedly benefited and one permanently cured.

I will relate one or two of these.

In December, 1898, Mr. H. came into my office after a very severe attack of asthma. He was about 35 years old, weighed about 120 pounds, and was 5 feet 6 inches tall, light hair turning considerably gray, pale blue or gray eyes and dark skin. I shall never forget the impression he made on me that morning.

I had been practicing in his family for two or three years and had good success. Other members of the family had told me of his condition, and that he had been the "rounds," and I really dreaded to see him come.

He gave me about the following history and symptoms: Had asthma for fourteen years, the last three or four of which he had been unable to do manual labor. He seemed to be as much a fixture in the "corner" by the fire as was his aged father. He could not get out of doors when the weather was the least damp or cold, for he knew the result would be from three to ten days' attack of asthma. His skin was sallow and dirty looking, his tongue was discolored, rather blue, and was coated some at base with a thin white coat. Eyes were extremely yellow and expressionless, and had been this way, for the most part, during the whole time of his illness. One of the most marked symptoms was, as he expressed it, "a stick of wood in his right side."

This "stick of wood" symptom in the region of the liver, or a feeling as if the liver were too large, together with the yellow discoloration of the sclera, led me to the selection of the remedy. I did not regard the name of his disease when I wrote my prescription, but gave the medicine according to the specific indications. Somehow, the whole time I was examining the patient I could think of nothing else but Chionanthus as the remedy, though I had never before used it in connection with this disease. So I prepared him a bottle of Specific Chionanthus and directed him to take fifteen-drop doses, night and morning, and report to me again in thirty days.

I continued this treatment for over six months without any variation, except to lessen the dose. I saw him from time to time and closely watched his symptoms and the action of the medicine. There was not much change the first month, except the "stick of wood" seemed to become smaller and his appetite improved considerably. Don't become discouraged when your patient does not get well in thirty days. My confidence in Chionanthus was so strong that I gave him nothing else. At the end of sixty days he had been exposed to cold, but had only a slight attack of asthma; the "stick in his side" was nearly gone; his bowels, which, by the way, had been obstinately constipated, were now acting regularly.

At the end of four months the "stick" was entirely absent from his side and his waist measurement had decreased three or four inches, and his coat and vest, the latter especially, were too large; but he had gained three or four pounds, showing that he had suffered extreme engorgement.

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At the end of six months I discharged him, but supplied him with enough Specific Chionanthus to last him two months longer, five or ten drops night and morning. He passed through last winter without an attack of asthma, something he had not done before for fifteen years. He accepted a position as machinist in a small town about eighty miles from Nashville.

I had a letter from him a few days ago. He said he was enjoying life, working hard and saving his money, and had had no asthma since I discharged him.

There are two other cases that I could relate, but will not at present, who were almost entirely cured. While they had some of the indications for Chionanthus, they were not so marked as the one above mentioned. I have one other case of asthma that has a splendid indication for the remedy, and, although I have been treating her only one month, she is much improved.

Don't give the Chionanthus unless you have the indications present and then use the Specific Medicine.—*J. P. Harvill, M. D., Georgia Eclectic Med. Journ.*

Chionanthus.—There is no more prompt and positive medicine in the *Materia Medica* than Chionanthus. When given in functional liver difficulties due to some wrong of the mucous surfaces or its ducts, it seldom fails. It will not cure all cases of jaundice, but it will cure nearly all in which there is no structural disease of the liver. It may be said to be specifically indicated by clay-colored stools, yellowness of the skin and conjunctiva, high colored, even brown urine, with uneasiness or pain in the right hypochondrium or region of the liver, or with abdominal pain or colic, and great prostration. It is another remedy that acts *dynamically*. Under older classification Chionanthus was said to be aperient, alterative, diuretic, narcotic, tonic to the stomach and bowels, and particularly emphasized as a *cholagogue*.

We believe that it stimulates the liver to more and better work, and that it awakens and tones up the digestive tract generally. It is *the* remedy for jaundice due to functional disorders of the liver. It may be given alone or in combination with podophyllum, nux, leptandra, or dioscorea, all of which are closely related to Chionanthus when judged by their actions on hepatic functions. They are all antitorpor liver remedies—liver stirrers. Chionanthus will materially assist in the prevention of the formation of gall-stones, and is of undoubted benefit in their expulsion. Acute dyspepsia is frequently relieved by Chionanthus. It is of great worth in hepatitis, both acute and chronic, but is not a specific in the jaundice of hepatitis. It often *settles* the irritable or refractory liver of the dipsomaniac.

Chionanthus has few equals in many cases of bilious, remittent and obstinate and intermittent fever. It is very beneficial in overcoming the slow convalescence that frequently follows exhausting diseases. Bilious colic has a conquerer in Specific Chionanthus. It relieves many cases of hypertrophic liver due to obstructions of its ducts and of a malarial character. The dose of Specific Medicine Chionanthus is from five to ten drops well diluted and frequently repeated. Chionanthus has strong recommendations for efficiency as a local application in the form of cataplasms or poultices in inflammations, in severe ulcers, and we rely upon it in certain lines, and we are not disappointed.

Specific Chionanthus has a very rank odor, a dark amber color, and although it occasionally precipitates a heavy sediment, it does not deteriorate.—*Editorial from the Eclectic Medical Journal, January, 1897.*

Chionanthus is a valuable remedy in the treatment of jaundice and other troubles of the liver and skin, as well as digestive troubles dependent upon functional diseases of the liver. The most prominent indication for Chionanthus is a jaundiced or saffron color of the skin and conjunctiva, with a sodden color of the tongue and mucous membranes. It stimulates the liver and glands of the skin to

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a more healthy action. Where a greater flow of the urine is desired—as is often the case in liver troubles—it is best to associate acetate of potassium with it.—*J. C. Ellis, M. D., Chicago Med. Times.*

Chionanthus is the remedy for liver affections. We have proven to our own satisfaction that it is vastly superior to mercury. The indications are tenderness in the hepatic region, enlargement of the organ, yellowish color of the skin, eyes or mucous membranes; in other words, evidences of jaundice. It is the remedy in these conditions, whether acute or chronic. We are now experiencing what seems to be an epidemic of catarrhal inflammation of the ducts, with an attendant duodenitis. Our prescription has invariably been Specific Chionanthus alternated with sodium phosphate. We have never had to change the prescription but once in all of our cases, though some of my medical brethren have not been so fortunate. With this peculiar color of the skin it is equally valuable in chronic stomachic and intestinal diseases. The dose is Specific Chionanthus $\mathfrak{z}$ ij to viii (according to age of patient), in half a glass of water, a teaspoonful of the mixture every two to four hours.—*W. N. Mundy, M. D., Eclectic Med. Journ.*

Prescription of Chionanthus. Fringe tree is the remedy par excellence in jaundice, torpor of liver, biliousness, clay-colored stools, threatened indisposition. It may be administered alone, or in combination with other hepatic remedies of known worth, as nux vomica or podophyllum, and, if the stomach is lame, Specific Medicine Hydrastis is added; the different remedies being selected according as the indication shall be. A common prescription with me in these troubles is the following:

R. Specific Chionanthus Vir. - - - -	$\mathfrak{z}$ ss— $\mathfrak{z}$ j
Specific Nux Vom. - - - -	gtt. x
Specific Hydrastis, - - - -	$\mathfrak{z}$ j— $\mathfrak{z}$ ij
Aqua Ment. Pip. - - - -	q. s. ad $\mathfrak{z}$ jv
M. Sig. Teaspoonful every three or four hours when awake.	

Sometimes $\mathfrak{z}$ ss— $\mathfrak{z}$ j Lloyd's Hydrastis is used instead of Specific Hydrastis.

Chionanthus is specific in jaundice, as I have demonstrated to my satisfaction. —*J. C. Andrews, M. D., California Med. Journ.*

Chionanthus.—Dose, one-half drop to thirty drops of Specific Chionanthus may be given in water every one to three hours. I use it when there is pain in right hypochondriac region extending toward stomach, and tenderness upon pressure over liver; also when skin is jaundiced or muddy, associated with high colored and scanty urine, etc. —*Benj. L. Simmons, M. D., Eclectic Med. Gleaner.*

Chionanthus Virginica. I will premise by stating that in this section of the country I believe Chionanthus is more frequently indicated than any other single remedy we possess; and that, for the last year or two, I have given it in more cases than any other drug; usually with certain and happy results.

I care but little whether the effect of Chionanthus is obtained by increasing the secretions of the skin or kidneys, or the aperient effect that King starts out with in his abbreviated description of the drug; but this I do know, if my patient is loaded down with malarial or mercurial poison, bilious, scrofulous, syphilitic, or other morbid material if he is yellow or heavy skinned Chionanthus is the remedy.

Goss speaks of the decided catalytic influence over the glandular system possessed by this drug. I have always thought that he referred to the liver in particular, and I have always claimed he was right; but I can claim for Chionanthus an equal value in many diseases that act on the other larger glands of the body.

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Yet I question whether I ought not also to ascribe more to phytolacca than I have been accustomed to do in the treatment of what we are in the habit of speaking of as glandular diseases, for in the treatment of these troubles both drugs work well, alternating with each other. I suppose both Goss and Scudder would claim, in the language of Goss, that "the most prominent therapeutical property possessed by the Chionanthus is its specific power over morbid conditions of the liver." I will join them and say, "I have tried it in hypertrophy of that organ, and with marked success, and in obstructions of the liver, in malarial districts with like success. It is near a specific in jaundice as is quinine in periodicity."

I always use Chionanthus as my first tonic after fever: but were it not for its slightly cathartic effects oftentimes I might think of some other drug to use in its place. While I am quite willing to laud the great worth of Chionanthus in this place, yet I think its most useful field of action lies in the power it possesses in chronic cases and not after convalescence from acute diseases.

As a diuretic its action I find to be valuable, not as well marked, but quite as certain as other more speedy and decided diuretics. I always use some other remedy with, or alternating with Chionanthus for this effect. In chronic disease of the kidneys, particularly in the advanced stage, and to correct functional wrongs in secretion and nutrition, no remedies in my hands have ever equaled the mixture of equal parts of *Lycopus Virginica* and Chionanthus.

We ought, by what we gain from King, to expect efficacious results from the use of this remedy in bilious, typhoid and obstinate intermittent fevers, but I regret that I am unable to report my observations of its action in these diseases.

In two remarkable cases of irregularity of the stomach and bowels I recently used it with satisfaction. Both cases presented the same symptoms: sallow, yellow skin; somber, dark, expressionless countenance; and all the other "Chionanthus symptoms." Some days, constipation prevailed, other days frequent diarrhoea, occasional nausea and vomiting; patients losing strength all the time. In the first case I used all the old means of relief—cathartics, astringents, and many things at many times that we hoped would act as a tonic to the mucous membrane and give tone to the stomach and bowels, "start up the liver," etc. I knew the patient needed Chionanthus, but we could obtain none at any of our druggists. As a consequence, the sufferer made no steps towards recovery, until we procured it. Two bottles, containing one-half ounce each of the Specific Medicine Chionanthus, and one ounce and one-half of water, led to a good recovery.

The other successful case was its exact counterpart, only the man had suffered the same way for more than three years, and his physicians had constantly been trying to remove his trouble. We gave him the following:

R. Chionanthus Virg. - - - - - $\frac{3}{4}$ j.
Water, - - - - - $\frac{3}{4}$ j.
M. Sig. Teaspoonful four time daily.

The effect was immediate.—*Dr. F. C. Gale, before the Illinois Valley Progressive Medical Association, 1876.*

SPECIFIC INDICATIONS AND USES.

"A remedy for jaundice, and as a gentle stimulant to the liver. This remedy exerts a special influence upon the liver, and to a slighter extent upon all the organs engaged in digestion and blood-making. The indications for it are yellowness of skin and eyes,

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slight or fully developed jaundice, with a sense of uneasiness in right hypochondrium, or general abdominal pain simulating colic. It is one of the surest remedies employed, whether the case is one of jaundice, formation and passage of gall-stones, bilious colic (yellowness of skin), acute dyspepsia, acute or chronic inflammation of liver, or the irritable liver of the dipsomaniac.

"Chionanthus is also indicated by a dirty sallow skin, with expressionless eyes, and hepatic tenderness, the passage of light grayish stools, and scant urine, which stains the clothing yellow. The liver-pain of Chionanthus may range from a slight uneasiness, with a feeling of weight and fullness, to an intense pain converging from the gall-bladder to the umbilicus, and attended with nausea, vomiting and marked prostration. An icteric hue, with or without pain, points to Chionanthus as the remedy.

Dosage.—Gtt. v to x of the Specific Medicine, in water.

"The dose will vary from the fraction of a drop to ten drops. I have had very satisfactory results from the usual prescription of Specific Chionanthus, gtt. x to water $\frac{3}{4}$ iv, in doses of a teaspoonful of the dilution."—*Scudder, Specific Medication.*

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$\frac{1}{4}$ -lb. Package		60c. each.	By mail, 82c. each.
$\frac{1}{2}$ -lb.	"	\$1.15	" Not mailable.
1-lb.	"	2.25	" Not mailable.

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Treatise No. VII will embrace Collinsonia.

Drug Treatise, Number VI.

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Asepsin.

History.—Asepsin is a sodium salt of methyl salicylic acid and was introduced by us to the medical profession about 1880. It was first noticed therapeutically in the *E. M. Journal*, May, 1884, p. 241, by the eminent surgeon, Professor A. J. Howe, in whose hands we had previously placed it for clinical investigation and at whose suggestion the term *Asepsin* was given the new antiseptic as the trade designation, the following being Professor Howe's (1884) introduction of the preparation:

"Asepsin is a delicate crystalline body, bearing the pronounced odor of checkerberry. The crystals readily dissolve in water, thus surpassing salicylic acid, and the agent in moderately strong solutions is not irritating to sensitive structures. A leading feature of *Asepsin* is its power to prevent both fermentation and putrefaction. Not a strong solution will preserve meats indefinitely. Inasmuch as the bichloride of mercury is an irritant poison, it has to be used with caution; therefore, something like Lloyd's discovery has long been a *desideratum*. I am now employing Asepsin where I have previously used boro-glyceride, carbolic acid, mercuric bichloride, etc., and obtain the most satisfactory results. In eczematous and epitheliomatous manifestations Asepsin may be utilized to advantage. It may be mixed with vaseline as a vehicle or with any nice cerate. It may be used in the nose instead of menthol to ease headaches and to prevent nervous rigors of various kinds, especially those of tuberculosis. In future I expect to use Asepsin to keep wounds as free as possible from putridity. The agent is not expensive, and consequently is economical, considering how far a small quantity will go.

"I have not employed Asepsin internally to a considerable extent. I found it to do excellent service in relieving a case of dyspeptic flatulence; and in minute doses it encourages digestive action. In as large as grain doses it increases respiratory activity, and slightly raises the temperature of the body."

Asepsin quickly became a favorite in its field of usefulness and by reason of its pleasant effective qualities, at once established itself as a valuable addition to the *materia medica*.

Description.—Asepsin is a crystalline powder, of alkaline reaction, nearly insoluble in cold alcohol, chloroform and ether, but soluble in cold and hot water and boiling alcohol. It has a sharp, sweet, wintergreen taste, thus differing from most other antiseptics, which as a rule are repulsive in odor and disagreeable in taste. If Asepsin be added to a dilute acid, even acetic acid, it immediately decomposes, wintergreen oil, separating in globules. This quality of liberating wintergreen oil led us to apply the term *nascent wintergreen* as a trade synonym for Asepsin, and undoubtedly the liberation of this compound gives to Asepsin much of its antiseptic and antiputrefactive qualities. Water, or mixtures of water and glycerin, should be employed as the solvent of Asepsin, freshly made solu-

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tions being preferred. Asepsin imparts a violet or purple color to solutions of ferric salts, the intensity of color depending on the proportion of the ferric salt. Asepsin mixtures (see therapy) are common prescriptions, two preparations of Asepsin having grown into great and general favor during the last twenty years, namely, *Borated Asepsin Mixture* (see p. 5) and *Asepsin Soap* (see p. 11). Information in detail concerning the use of these preparations, as well as of Asepsin and its combinations, may be obtained from the writings of medical authorities from whose contributions in addition to the special article by Professor John Fearn, M. D., a few selections are herewith presented. The qualities of Asepsin, as determined and published twenty years ago, and to which nothing need be added or abstracted, are reproduced as follows:

"Asepsin is especially valuable as a dressing for wounds and sores. Being antagonistic to all grades of lower organic life, vegetable or animal, it keeps the wound clean and healthy.

"It prevents putrefaction, as is shown by the fact that fresh fish will keep longer in a one per cent. solution of Asepsin, than in a similar solution of either boro-glycerid, boric acid or carbolic acid, and it does not, like salicylic acid, harden albuminous material.

"It is not offensive; on the contrary, has a pleasant wintergreen odor and taste.

"It has no give-away smell like carbolic acid.

"It does not harden the tissues like salicylic acid; on the contrary, keeps them soft and pliable.

"It is not poisonous like corrosive sublimate; and while overdoses internally produce a burning unpleasant sensation, the irritation is less than that of carbolic acid.

"In weak solutions, such as should be used, it is entirely harmless. Ten grains to a pint of water is strong enough for antiseptic surgery."

THERAPY AND USES OF ASEPSIN.

BY PROFESSOR JOHN FEARN, M. D., Oakland, California.

Who can estimate the debt the world owes to antiseptics? And yet, with the most effective remedies of this class, the vile odor has been a great drawback. Well do I remember a young man who, many years ago, came to see me to be treated for a venereal disease. In the employ of a merchant his business led him as a collector to visit the homes of the people. As I was about to give him medicine he pleadingly said, "Doctor, do not give me iodoform. The people can smell it as I stand on the doorway." I do not use iodoform and he was therefore spared the humiliation. How differently do we speak of Asepsin, the article under consideration. Some one has named it *The Nosegay Antiseptic*.

What are the properties of this drug, Asepsin? We answer, the properties it possesses are antifermentive, antiputrefactive, antiseptic-

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tic, stimulant and slightly alkaline. That it is an anti ferment has been proved in clinical use, and is also shown in its power as a preservative for sweet cider, which also exhibits its harmless qualities for such preserved cider may be drank freely. Dr. Albert Sayler gives this formula for a 45-gallon barrel of cider. R. Oil sassafras, and Asepsin, of each one-half ounce; alcohol, 10 ounces. Mix (the Asepsin does not dissolve) and add to the cider at once. This cider is delicious and may be called *Asepsinated Cider*. Dr. Sayler advises the use of "Asepsinated Cider" in cases of muscular and arthritic rheumatism. What Asepsin will do for the cider it will accomplish in the alimentary canal. Where there is acid fermentation, add ten grains Asepsin to one ounce Sodium Bicarbonate, triturate well, and give in three-grain doses every one to three hours. You will see a marked improvement. Whenever the call is for alkalies, whether it be Sodium Bicarbonate or Sodium Sulphite, the alkaline salt will do better work if Asepsin is added. Besides, the combination is much pleasanter than with either of the salts singly.

My friend, Professor Lyman Watkins, M. D., has fully demonstrated the power of Asepsin as an Antiputrefactive agent. He showed by experiments in the laboratory that this remedy not only retards decomposition, but checked it when under process in flesh which had been exposed to the influence of other antiputrefactives without any benefit. In November last I proved this in clinical practice with a patient afflicted by gangrene of the scrotum, tissues turning black, odor most nauseating. The parts were thoroughly cleansed by ablution with hot water. I then made a lotion: R. Asepsin, grs. xxx; Aqua pura, ʒ xvi. M. Sig. Apply thoroughly, then saturate lint and use as a moist dressing. The fetor was speedily overcome. Besides, as pointed out by Professor H. W. Felter, M. D., Asepsin in surgical cases slightly liquifies albumen, thus differing from Carbolic Acid and Salicylic Acid in not causing coagulation and consequent hardening of the tissues. This is a grand advantage.

As a dry healing dressing, use *Antiseptic Powder*, Asepsin thoroughly triturated with Sodium Borate. Ten to thirty grains of Asepsin to the ounce of powdered borax is sufficient. It will sweeten, soothe and heal most satisfactorily.

Professor R. L. Thomas, M. D., exceptional good authority, speaks of Asepsin in passive and alarming hemorrhage from a uterine fibroid. For six weeks he administered: R. Asepsin, grs. x; Aqua ozs. iv. M. Sig. Teaspoonful of the solution every half to one hour during the hemorrhage, then four times a day. The patient

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was relieved of the hemorrhage. Those who have used Asepsin praise it (ten grains to the ounce of water) for its healing and soothing influence in burns and scalds. Being alkaline in reaction it answers this purpose admirably. As a deodorizer you will be pleased with the action of Asepsin in cancerous tumors, in fetid feet and offensive armpits. In gynæcology, it has a very extensive field of usefulness where we have extensive ulceration, accompanied by fetor. In cases of profuse and offensive leucorrhea, in fetor after abortion or confinement, especially where the membranes have not been thrown off, there is, in my opinion, nothing better than a dilute Solution of Asepsin, or, preferably Borated Asepsin Mixture (see formula, below).

Asepsin Solution forms one of the best applications in cases of diphtheria, sore throat, catarrh, ozæna, and for spraying old foul smelling ulcers, whether varicose, syphilitic or cancerous. It overcomes all bad odor and aids the healing process. Some oculists who have become acquainted with its valuable properties are using it as a collyrium for the eyes in cases of congestion and inflammation, especially if there be purulence. It may be used in these cases dissolved in water, in the strength of one or two grains of Asepsin to the ounce. In cases of chronic catarrh where we have thickening of nasal mucous membranes amounting almost to occlusion, with thick and foul secretions, after first cleansing the parts thoroughly with Borated Asepsin Mixture, apply an ointment made as follows: R. Asepsin, grs. iii to grs. v; Howe's Juniper Pomade, $\frac{3}{4}$ i. Mix thoroughly. Apply to the nasal passages every day. The good results are a surprise.

Solutions of Asepsin for either internal or surgical use need not be strong. Indeed, it is better not to exceed five grains of Asepsin to the ounce of water. Less than this answers all purposes as a throat spray, while in antiseptic surgery ten grains of Asepsin to a pint of water are sufficient.

Borated Asepsin Mixture.—This very useful addition to the surgeon's stock is one of my favorite compounds. Formula: Asepsin, drachm i; Sodium Borate, drachm i; Glycerin, ozs. ii; Aqua Destil., ozs. vi. Compound it as follows: put the Asepsin in a glass or wedgewood mortar, add the Glycerin a little at a time, rubbing together until a smooth mixture results. Dissolve the Sodium Borate in the water, then add the Asepsin mixture, agitating briefly, after which it may be filtered. Ordinary filtering paper may color it red, but a plug of absorbent cotton in a funnel answers admirably. Since I devised this preparation some years ago it has been employed

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by physicians all over the country as a valuable internal remedy. It can be varied in Asepsin strength according to the judgment of the physician. In cases of atonic dyspepsia it may be combined with Specific Nux Vomica. To the usual dose of Specific Nux Vomica in ozs. iv of Aqua Destil. add drachm i to drachms iii of the Borated Asepsin Solution. Dose, a teaspoonful every two to four hours. This Nux Vomica mixture slowly separates an alkaloidal, flocculent precipitate, and must then be well shaken when each dose is taken. It tends to relieve nausea, sweeten the intestinal canal and overcome gaseous distention. Besides, the Borated Asepsin Mixture acts as an antiferment to the solution of Nux Vomica and is a better preservative than either syrup or alcohol for any aqueous solution. Try Borated Asepsin Mixture as a fortifying antiseptic agent with the proper indicated remedy in cholera infantum or cholera morbus or dysentery. In fact, anywhere that you are contending with vitiated secretions. It can also be used as a spray in various strengths, diluted with water, as the judgment of the physician shall direct.

Whoever wants a pleasant dentifrice and mouth sweetener will seek far before finding one better than the Borated Asepsin Solution. One part Borated Asepsin Mixture to two, three or four parts of pure water will do good work.

A saponaceous dentifrice is made as follows: Asepsin Soap, drachm i; Aqua, ozs. viii. Dissolve the Asepsin Soap in the water and add Borated Asepsin Solution, ozs. iii. Use with tooth brush. This is cheap, pleasant and efficient.

Additional Remarks.—The following supplementary reports concerning Asepsin are from medical publications in which the authorities named commend the remedy to the profession in treatment of the affections cited:

Asepsin in General Practice.—Asepsin may be used as a dressing in connection with any surgical operation, wound, ulcers, etc. I have used Asepsin by mixing it with cerate, vaseline, colorless hydrastis, and water, according to the condition or surface to which I wish to apply it. In treating scarlet fever or diphtheria, gr. ii or iii to the ounce of water is used as a gargle every two or three hours. It will remove the ulceration or deposit very speedily and much sooner than any other preparation I have ever used in the above named diseases. Another great advantage Asepsin has over all other articles used for the same purpose is that nine-tenths, yes, ninety-nine one hundredths of the people like the odor of Asepsin.

I have used it in obstetrical practice quite extensively and find it has no equal for subduing offensive lochial discharges. It may be used by dusting the powder upon the napkin applied, or anointing the parts with Asepsin Ointment.

I frequently add grs. ss to the ounce of water when I prescribe any remedy diluted with water to be administered internally. This addition prevents the decomposition of the diluted preparation and destroys the germs that would soon

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aid decomposition of the dilution. I have been using Asepsin about grs. iii to the ounce of water to wash out the throat in a case of thoracic abscess, using it twice daily, with the very best result.

As a remedy for nasal catarrh I add one-half grain to the ounce of Lloyd's Hydrastis, and with a spray or atomizer, apply to the part affected, with happy effect. In all cases it is certainly a specific formula for catarrh. Crusta lactea and prurigo can be speedily relieved by an ointment of Asepsin and Vaseline.—*A. P. Taylor, M. D., Columbus, Ohio.*

Asepsin in Antiseptic Obstetrics.—A correspondent wishes to know what antiseptic obstetrics means and how it is to be conducted. In reply, I would say that clean hands wetted with a solution of Asepsin before manipulations are made to constitute about all there is in midwifery antiseptically conducted. Clean beds, napkins, towels, and binders are a septic and need not be medicated with antiseptic solutions. If coagula and fragments of the placenta remain in the uterus, the cavity of the organ should be douched with a warm and weak solution of Asepsin. Ten grains to a pint of water will make the antiseptic strong enough to wet the obstetrician's hands, or to be used as an intra-uterine injection. If a tampon be employed in the vagina it is well to wet the fabric forming the plug with the least objectionable antiseptic known—with a solution of Asepsin. Carbolic acid and efficient solutions of corrosive sublimate are irritating and poisonous.

It is not necessary to render the ligature which constricts the funis antiseptic, yet there is no objection to the precaution. I sometimes employ the aseptic animal ligature which I use in general surgery. Ligatures preserved in a solution of Asepsin are soft and pliable as silk and not hard and stiff, as they used to be when kept wet in carbolized oil.

The blades of forceps, and other obstetrical instruments should be mopped with a solution of Asepsin before use.

A plug or pledget of antiseptic lint kept in the *os tincae*, or in the *ostium vaginae*, after delivery, is not required. Too much zeal in the matter of employing antiseptics in deliveries is not evidence of greatness.—*Professor A. J. Howe, M. D., Cincinnati, Ohio.*

The Field of Asepsin.—Asepsin is eminently capable of arresting fermentation and putrefaction, brought about by the agency of formed ferments. It does not affect the ferments of the body, such as pepsin or pancreatin; it has a distinct action upon the bodily temperature, but inversely to other hydrocarbon products. It raises the temperature of the body to quite a notable degree, and hence could not be used as an antipyretic. Applied to the unbroken skin in 10 per cent. solution, it produces a sensation of warmth a very short time after application.

Denser solutions of the salt redden the skin slightly and render it quite stiff. Applied upon mucous surfaces it acts very energetically. It does not coagulate albumen, in fact it slightly liquifies it, and thus differs from salicylic and carbolic acids. Being exceedingly soluble in water, it can be used in solutions of any density.

As an antiseptic it is both safe and very ready of application. I have lately made exclusive use of it in many surgical operations with the best results. In putrid sore throat, in indolent ulcers, in lax granulations it is very effective as a local application, and has that agreeable quality of not being offensive to the sense of smell, like carbolic acid or thymol. In solutions of 10 to 15 per cent. and denser it acts as a mild caustic. Applied in substance upon vegetations on the mucous surfaces it speedily arrests their development and flattens the surface very much. It acts in some respects different from many caustics, by being able

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to be distinctly regulated in its intensity. It produces no scar on the cauterized surface, but diminishes the secretions greatly and does not dry them up.

Internally, I have used it very cautiously, as it is readily decomposed in the stomach into Oil of Wintergreen. In doses of one grain, well triturated with powdered starch or licorice root, I gave it to a person who suffered from very offensive ructus, after each meal, with good results. As a gargle and mouth wash in stomatitis, both idiopathic and from pharyngeal or nasal catarrh, it is very effective and pleasant. In large doses it acts injuriously, as I have found to my own discomfort. It causes terrible burning in the stomach, dryness of the throat, even of the rectum after the intestinal contents have been emptied. It does not seem to be readily absorbed, but seems to pass the tract as Oil of Wintergreen, as its odor readily indicates. In smaller doses and well triturated as said above, it passes into the blood and can be found in the urine by the test for salicylic acid, yet having the odor of Oil of Wintergreen perfectly distinct.

Its best quality I consider to be that of a very powerful antiseptic in the most extensive sense of the term, and is preferable to most and, in fact, all others; first, by being highly soluble in water; secondly, by being very easily regulated, and producing now a slight caustic action, at other times only purely antiputrefactive; thirdly, as it does not reduce the temperature of the locality to which it is applied, it can safely be used in lacerated and highly contused wounds where quantities of the tissues are more or less destroyed and great care is required to prevent gangrene or sphacelus forming from sudden reduction of temperature in the highly lesioned tissues. — *Professor A. J. Jeancon, M. D., Newport, Ky.*

Asepsin Internally and Externally.—I have used Asepsin ever since it has been on the market, and every year has increased its uses until I now employ it in most all cases where a disinfectant or antiferment is indicated.

I use it both in solution (two to four grains to the ounce of water), and in trituration (one to nine parts sugar of milk), as circumstances seem to require. Its odor being pleasant, renders it preferable to other disinfectants that make the physician think of a dissecting room and the patient think of the dead. In surgical practice it can be added to water and soap to cleanse wounds with an offensive discharge of pus. The trituration can be dusted upon absorbent cotton, or the cotton may be moistened with a solution, and the wound be dressed in this manner. If the dressing be changed once or twice daily there will be no smell.

On old tibial ulcers it acts very nicely. It comes as near removing the smell of cancer as anything with which I am familiar. It makes it possible to live in the same house with a patient who has a necrosed bone. I have used it on three insane patients who had cut their throats; in one of the cases there was dead cartilage to contend with, but there was no smell. It helps to conceal a bubo and renders a scrofulous ulcer bearable. In abortion the tampon may be dusted with a trituration of Asepsin, or a solution added to the cleansing injection, after abortion, or delivery at full term.

Its internal uses are many. Added to water in a very small quantity it makes a very pleasant mouth wash. It cleanses bad teeth, and relieves that unpleasant condition of the mouth in typhoid fever.

Used in the throat, and with salt water in the nose, the offensive smell of catarrh is removed.

In mania and dementia, when the patient fails to cleanse the mouth with the tongue, and particles of food remain to ferment and to make the breath and mouth so dreadfully disagreeable, Asepsin is a specific

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I use it to cleanse all conditions of the throat where an antiseptic wash is needed.

While in both stomach and bowel trouble where there is fermentation and distention, with gases, it is *the* remedy.

I often use the trituration with pepsin or hydrastis in indigestion. In cholera infantum it can be alternated with other remedies and will prove of great value.

I often use it to flavor medicine when children object to the taste.—*Bishop McMillen, M. D., Columbus, Ohio.*

Asepsin in the Treatment of Ulcers.—Last September Mrs. H. brought to my office a child, aged two months, with two large ulcers: one, two inches or more in diameter, situated at the base of the occipital bone, and so deep that the external surface of the occipital bone was visible. The other, some smaller than the first, was situated on the shoulder near the acromion process and was not so deep as the first. The mother told me, when the child was born, two large blisters, where the sores now existed, were filled with serum. The attending physician at the time of birth punctured the bullæ and left a powder to be applied. This doing no good the mother began using mullin salve and other preparations that the neighbors recommended, nothing seeming to do any good, but rather made the ulcers more irritable. On examination I found the sores secreting a thin watery fluid streaked with blood and fetor, enough to lift one off his feet. I gave the mother a small box of Lloyd's Asepsin, directing her to put one grain of Asepsin in four to six ounces of hot water and sponge the ulcers three times a day with this preparation as hot as could be borne by the child. I did not give her anything else to apply, but ordered her to keep cloths wet with the Asepsin Solution on the sores after washing them. My intention was to have the ulcers thoroughly cleansed before applying anything else to aid nature. I saw that the mother was anemic with a peculiar blueness of the tongue, which caused me to prescribe for her Howe's acid solution of iron, thinking the child might also derive some benefit from the iron mixture. I asked her to return in two or three days. On the morning of the third day she came again, on examination of child, found no fetor and the ulcer granulating nicely. Ordered the application of the cloths continued with a weaker solution of Asepsin without sponging, and in three weeks from beginning my treatment the case was dismissed cured.—*F. J. Livingston, M. D., Salix, Pa.*

Asepsin in Dental Practice.—Asepsin is a pleasant antiseptic that has only recently been brought to our attention, and is the outcome of a series of experiments with gaultheria or our indigenous wintergreen.

It is soluble in water, and a little in the warm water used for syringing out cavities at the time of treatment or prior to filling is grateful, and elicits, especially from children, words of appreciation, for it imparts to the water a delightful taste and sense of cleanliness.

In removing stains from the enamel it has been my habit to place a few drops of glycerin on the dish with the pumice. I now substitute Liquid Asepsin, which is made as follows: To one drachm of Asepsin in a bottle add four drachms of alcohol and shake well, now add twelve drachms of glycerin, and upon shaking the mixture the Asepsin will be dissolved. This has the consistence of syrup and prevents the pumice from flying when used with the polishing points on the engine, it also aids in removing the stain and gives the paste the characteristic perfume. I have as a substitute for this solution of Asepsin used the powder in small proportions mixed with the pumice, but prefer the liquid.

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For a long time it was no small problem for me to solve how best to care for and render aseptic my mouth mirrors. I could not submit them to the heat or to hot water. Bichloride would injure them, and I did not feel at all satisfied to use them from patient to patient. When I first made Liquid Asepsin I questioned the powerful antiseptic qualities of the preparation, and the word of its originator, and such surgeons as Prof. A. J. Howe, who says "Asepsin is one of the most valuable antiseptics known." I have never given it or any other preparation the tests that Miller and others have, but it certainly is a pleasant way to wash off the mirrors or to dip in the solution and allow to remain some time.

It is non-toxic, non-corroding, and leaves a film of glycerin on the glass, thereby preventing the patient's breath clouding it, while the gustatory filaments of the tongue must convey the sensation of pleasure to the patient if any of the liquid remains on the mirror.

In taking impressions with plaster, by sprinkling a little Asepsin in the water prior to wetting the plaster, the setting of the plaster is not interfered with, while the objectionable taste is largely overcome. As an ingredient to all washes, and to revive tooth-powder that has lost its flavor, a very little Asepsin is sufficient.

A combination of Borax and Asepsin has been useful in my hands in the form of a mouth wash, which can be used for its alkaline, detergent and antiseptic qualities. I direct that the patient use it in conjunction with massage.

I think in case of putrescent pulp it has a place. Gutta-percha kneaded and worked with the powder and used for root-filling will keep its odor for a long period, and it is said that the muco-organisms that thrive with iodoform can not live in Asepsin.

These are some of the uses of Asepsin in dental practice; believe it has more. I am grateful that there has been found a *pleasant* polychrest for the dental office that is not offensive and is not a deadly poison.—*Fred. I. Sumner, D. D. S.*

Action, Medicinal Uses, and Dosage.—Asepsin is one of the most important of the more recent introductions into medicine, and in the Eclectic school is the most extensively employed agent for antiseptic purposes where putridity is to be overcome.

As a local antiseptic, Asepsin has had a more extended use in the Eclectic school than any other topical agent of this class. Very dilute solutions act as a pleasing cleansing agent; solutions of 20 per cent. or higher are mildly caustic, but do not leave a scar nor dry the secretions. Wounds treated with Asepsin or Asepsin in Hamamelis heal kindly. Applied to cancerous growths, its deodorant effects are remarkable. Applied to an extensive and foul cancer after death, it removed the odor so effectually that no stench could be observed at the time of burial three days later. It is useful to assist in curing and removing fetor from foul and intractable scrofulous ulcers and buboes; offensive armpits and fetid feet are deodorized by it. Applied to burns it controls the pain and promotes healing, with less tendency to cicatrization than by other forms of treatment. A cerate or ointment of it may be applied, having previously well washed the parts with a moderately strong solution of Asepsin in water. An elegant dressing for burns, scalds, cuts, abrasions, lacerations, and contusions, consists of a solution of five to ten grains of Asepsin in one fluid ounce of distilled Hamamelis. In all surgical operations Asepsin may be used in solution as a wash, and applied in trituration or solution as a dressing. Dr. A. P. Taylor employs a solution of three grains of Asepsin to one ounce of water to wash out thoracic abscesses. Many skin affections requiring alkaline medication and strict cleanliness may be treated with a solution or ointment of Asepsin. It is especially useful in rhus poisoning, porrigo,

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chronic eczema, and crusta lactea. A solution of Asepsin, or combined with hamamelis, sodium sulphite, or potassium chlorate, is very effectual in the angina of scarlatina, and assists in removing the false membrane in diphtheria. Vegetative growths may be removed with a 20 per cent. solution of Asepsin. Cloths wetted with Asepsin solution ($7\frac{1}{2}$ grains to water oj) and applied to the breasts may abort mammary abscess when irritable and chapped nipples are a complication. Mixed with egg albumen it also forms a good application to sore nipples. To cure foul, indolent tibial ulcers, Prof. John Fearn recommends the addition of five grains of Asepsin to one ounce of ointment of Umbellularia Californica (leaves, 8 ounces; petrolatum, 1 pound; cook until crisp and strain), the parts having first been washed with a solution of Asepsin. An ointment of Asepsin has given excellent results in pruritus ani. Triturated with an equal amount of bismuth subnitrate and applied locally, associating with this the internal administration of apis, podophyllum, and hamamelis, it has cured a long standing case of piles.

Asepsin has a wide application in gynecological and obstetrical practice. For foul-smelling, acrid leucorrhœa, a wash of Asepsin forms an effectual treatment, and more especially if combined with borax. As a cleansing and deodorant application after labor it has no superior. An injection of hot Asepsinized water, with or without the addition of borax or potassium chlorate, does excellent service in cleansing the parts of the foul discharges due to fragments of retained placenta, the womb being first curetted, and in removing offensive lochial accumulations. It has thus rendered excellent service after the birth of dead and decayed fetuses. Gonorrhœa in the female, as well as in the male, is well treated by a small portion of Asepsin ($\frac{1}{2}$ grain) in about four fluid ounces of warm water or liquid albolene.—*American Dispensatory.*

Specific Indications and Uses of Asepsin.—"Fermentation and putrefaction, pale tongue, or dusky coloration of throat and tongue; fermentative dyspepsia, with atony, flatulence, and colicky pain, abdominal tympanites; borborygmus; prune juice evacuations; feeble capillary circulation with tendency to breaking down of tissues; rhus poisoning, ulcerations, etc. A general antiseptic for surgical, gynæcological and obstetrical operations.

"Asepsin is one of the few agents that gives decided relief in *periodical hyperæsthetic rhinitis or hay fever*. For this purpose the following may be used to relieve the distressing irritation and consequent sneezing: R. Asepsin, grs. vj ; cocaine hydrochlorate, grs. j ; petrolatum, ̄i . Mix. Sig. Apply to mucous membrane of the nose as needed. A solution of menthol and Asepsin in liquid albolene is also effectual in this disorder.

"The dose of Asepsin for internal use ranges from a fraction of a grain to $\frac{1}{2}$ and rarely 1 grain. As a local application solutions varying from 1 to 20 per cent. may be employed, as circumstances warrant; ointments and liquid albolene solutions may be used of similar strengths. Of the compound powder of Asepsin (grs. x to xv) and sodium bicarbonate (oz. i) the dose may range from 1 to 20 grains."—*Professor H. W. Felter, M. D., in American Dispensatory.*

Asepsin Soap.

History.—The remarkable antiseptic qualities of Asepsin and the fact that it is compatible with alkaline compounds, naturally led to its employment as a constituent of soap. Pleasantly fragrant and yet imparting no odor to the skin, being both non-poisonous and non-irritating, Asepsin is exceptional as a medicating soap foundation. It is well known that Salicylic Acid is instantly destroyed when brought into contact with soap, while Carbolic Acid and Thymol, etc., are offensive. These disadvantages are all avoided or overcome in Asepsin Soap, which is a compound of Asepsin, borax and true tallow soap stock.*

Qualities.—The qualities of Asepsin Soap are apparent. It is clean, dry, permanent, harmless and pleasant. Its mild nature fits it for both toilet and medicinal purposes, while its moderate price permits its employment in families generally. For bathing children and invalids, for preserving the skin, for use during epi-



CUT OF ASEPSIN SOAP.—Natural Size.

demics and by persons exposed to contagion, it is exceptionally valuable. Each cake weighs four ounces and is accompanied by a circular giving its field of usefulness. It can be kept indefinitely, and for the use of travelers who shrink from touching soaps found in hotels, Asepsin Soap offers exceptional qualities.

As a Medicinal Soap.—Physicians will appreciate the value of Asepsin Soap in skin diseases and surgery from the following facts: Asepsin is the only pleasant antiseptic known. It is not offensive or dangerous as are most other antiseptics, but on the contrary, is pleasant to both the taste and smell. It is the only antiseptic that will keep the tissues soft and pliable. The soap is a

(*) We do not use a vegetable oil, such as Coconut Oil, because although white and sweet when fresh, the vegetable-oil soap becomes rancid and irritating when seasoned.

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combination of the antiseptic Asepsin, borax, and selected soap stock. It is not asserted to be a cure-all for all the diseases to which the skin is heir, but naturally a combination embracing the stimulating and soothing properties of a pure soap stock, combined with the antiseptic properties of Asepsin and borax, will correct many cutaneous troubles and as a purifying agent will admirably aid physicians during the course of appropriate treatment.

Cutaneous Diseases.—For the following skin affections it may be used freely with marked benefit, especially when supported by rational internal medication: *Acne vulgaris et rosacæ*, *seborrhœa*, eczematous eruptions, herpes, psoriasis, prurigo, syphilitic eruptions, dermatitis, ulcerations, pruritic conditions, parasitic diseases, as scabies, for the relief of rhus poisoning, and for the removal of pediculi. A clean skin is necessary in any course of medication and Asepsin Soap is a rational cleanser.

In Surgery.—The surgeon finds it valuable for cleansing the patient, the operator's hands, sponges, and instruments. For its cleansing and antiseptic effects it may be employed in wounds of all kinds, chilblains, bed sores, ulcerations, pustules, for removing offensive and irritating discharges, and as a foot wash.

In Gynecology.—It is useful in all irritating and offensive discharges concomitant to diseases of females, giving rise to pruritic and inflammatory conditions. *Leucorrhœa*, simple vaginitis and vulvitis, ulcerations, and pruritis *vulvæ* are conditions in which it is particularly indicated. Many physicians carry the soap constantly in their obstetrical bag and leave a cake whenever they have a case of confinement. It is invaluable for washing young babes for it does not injure their delicate skin.

USES OF ASEPSIN SOAP.

BY PROFESSOR JOHN FEARN, M. D., Oakland, California.

The first commendation of Asepsin Soap is the purity of the article. There is no perfumery in it because there is no bad odor to cover. It is a true tallow fat soap to which certain amounts of powdered Asepsin and Borax are added. It lathers well. It is a good detergent and cleanses thoroughly. Every surgeon of experience knows how difficult it is to remove odors from the hands after dissecting, or when working around malignant growths. If, however, the hands be first thoroughly washed with hot water and Asepsin Soap, and a little ordinary cologne be rubbed on until absorbed, no unpleasant odor will remain. For shaving, Asepsin Soap in the opinion of Dr. V. C. Price is a success. This I corroborate because I use it several times a week.

ASEPSIN SOAP.

In skin diseases of all kinds, it is the best general soap to use. There are times, it is true, when I would prefer to use a mercurial soap preliminarily for a short time.

For a general vaginal wash, I know of nothing more applicable than solution of Asepsin Soap. A good many years ago a cervical operation was performed on one of my patients together with a curettement. Her case was of long standing and though the operation was a decided success yet for a long time there was trouble. It seemed hard to overcome the irritation. I advised a strong suds made from Asepsin Soap, using the injection thoroughly every day. The results were speedily good. She informed me that she was in good health and still using Asepsin Soap. It left such good results that she continues to prefer it to any other wash or irrigant.

For infants, I know of no soap more preferable than Asepsin Soap. It cleanses thoroughly, it leaves the skin cool, soft and pliable. After eruptive fevers in either children or adults it should be used freely as it hastens desquamation and thus tends to check further spreading.

In dandruff and where the scalp is hot or itches, it makes a good shampoo, and its use is attended with the happiest results.

In Rhus Tox. poisoning, wash the parts well with hot water and Asepsin Soap; then make a heavy creamy suds and lather the parts repeatedly every two or three hours. It will help speedily. The following from the writings of Professor F. J. Locke, M. D., is of interest as bearing on this use of Asepsin Soap:

Cutaneous Eruption.—I have recently had an interesting experience in a stubborn case of cutaneous eruption. The patient, a student in the Eclectic Medical Institute, during a botanizing tour last June, came in contact with the Rhus Toxicodendron vine, and (being very susceptible to its poisonous action) was infected by it, and passed through all the acute phenomena, peculiar to the toxic effects of that plant. For a time the inflammatory state would pass away, under the influence of medical agents, leaving a scaly condition of the skin, only to return with increased virulence.

The affected hand itched continually, and the young man by unconsciously applying his hand to his face and eyes, soon had the toxic infection transferred there. The eyes were so swollen and oedematous as to almost completely obstruct vision. He was finally obliged to leave college. Before coming under my care he had taken tincture of iron internally, and used locally subnitrate of bismuth and lead acetate, and zinc sulphate solution had been applied, but the relief obtained therefrom was only temporary. The disease had seated itself and become chronic. He was in fact, discouraged, for he was never entirely free from its painful and annoying manifestations.

In this condition he applied to me in November for relief. I immediately ordered as local treatment, Asepsin Soap, to be made into a lather and to be applied as a thick lather four or five times a day, directing that he allow the lather to partially dry and to wipe the part without rinsing with water. This gave imme-

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diate relief. The intolerable itching disappeared at once, and for the first time in months there was an intermission of the persistent itching. At the same he was given internally: R. Specific Apis, gtt. x; Specific Rhus, gtt. v; Specific Apocynum, gtt. xx; Water, oz. iv. M. Sig.—Teaspoonful every hour. He had also an occasional dose of acetate of potassium, well diluted with water.

The treatment was continued about a month, although the pain had disappeared with the application of the soap. The result was most gratifying. In a remarkably brief space of time the eruption, itching and swelling were gone, and up to date he has had no return of the malady. He now considers himself wholly free from the toxic influence—a condition he has not enjoyed for some months past. I attribute the cure to Asepsin Soap, used in the manner indicated, and believe that it will prove an exceedingly desirable local application in both acute and chronic forms of dermatitis venenta or rhus poisoning.—*F. J. Locke, M. D., Newport, Ky.*

Asepsin Soap in Skin Diseases.—In March of this year, Mrs. P. was delivered of a male child. The labor was natural in all respects and mother and child did well up to the sixth day.

The evening of the sixth day the father came to the office and said the child had large water blisters on the nates and had a little diarrhœa. Medicine was given for the diarrhœa, and acting on the supposition that the eruption was due to the acrid discharges, strict cleanliness as to napkins was enjoined while lycopodium was dusted on the nates and in the folds of joints each time the child was changed.

The next morning I was advised that the blisters were spreading. The child was visited and it was found to have large bullæ upon the nates, inner side of thighs and on the abdomen under the band. Temperature elevated, child peevish. The diarrhœa was soon checked, but the bullæ continued to spread, extending over the entire lower limbs, on the abdomen, though not so thickly as on the lower limbs, and also in the axillary region. Many of the blebs were as large as silver quarters. When they broke they left a large raw surface. Contact of the discharges with these raw surfaces would almost cause spasms. The child of course was fretful and emaciated rapidly. Rhus tox and various remedies were given internally. Externally, lycopodium and oxide of zinc were used dry, the latter was also used as an ointment. Subnitrate of bismuth was also tried, but seemingly to no purpose. Almost in despair, Asepsin Soap was ordered for bathing purposes. A thick suds was made and the child was bathed twice daily with it, the lycopodium being used on the raw surfaces and in the folds of the joints as a dusting powder. The child soon began to improve and the improvement was continuous and rapid. The family and doctor attribute the rapid change to the Asepsin Soap.

Recently the Asepsin Soap was used in the same manner for a case of eczema of the scalp on a child. The results were equally pleasing. It was also used during the past week for a severe case of rhus poisoning in the manner described by Prof. Locke. The result was equally favorable.

It has been found to be a very valuable adjunct to our remedies for skin diseases. Asepsin is a good antiseptic and consequently the Soap is equally valuable to the surgeon and obstetrician. When a mother asks for a good soap with which to wash the baby, Asepsin Soap is invariably ordered. It is also ordered for those suffering with chronic skin diseases. Combining all these features and being both pleasant and made of pure fats it can not help but be a fine toilet soap as well, which we have found to be the case.—*W. N. Mundy, M. D., Forest, Ohio.*

ASEPSIN AND ASEPSIN SOAP.

MATERIA MEDICA STUDIES.

The accompanying treatise is part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of *Materia Medica*, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressly for these fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional.

The history, description, pharmacy and chemistry will be written by John Uri Lloyd.

Back numbers of these studies will be supplied physicians and pharmacists, on application, as long as they are in print; but, as we make no remedial agents for the public, and are opposed to the encouragement of self-medication by the people, we can not supply them to persons outside the professions.

This fascicle will supply a demand for descriptive literature concerning the subjects treated, being the most complete treatise extant regarding these valuable preparations. The fascicle to follow (Drug Study No. VII) will present *Collinsonia Canadensis*, a drug of unusual interest and of long continued use.

PRICES OF ASEPSIN.

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¼-lb. "	3.80 "	Not mailable.

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For sale by Pharmacists generally and by all Wholesale
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APRIL, 1904.

LLOYD BROTHERS, Cincinnati.

A TREATISE

ON

Collinsonia Canadensis.

The Therapeutic Uses of Collinsonia Root are by Professor W. N. MUNDY, M. D., Author of the Eclectic Practice and Diseases of Children, recently Professor of Physical Diagnosis, Hygiene and Diseases of Children, Eclectic Medical Institute.

The Selections are from the writings of

H. T. WEBSTER, M. D.,	JOHN W. FYFE, M. D.,
J. M. SCUDDER, M. D.,	F. J. LOCKE, M. D.,
H. W. FELTER, M. D.,	

The Therapeutic Uses of Aromatic Specific Collinsonia are by Professor KENT O. FOLTZ, M. D., and GEORGE P. BURTCHBY, M. D.

The Illustration is drawn for this Treatise from the drug by Mr. W. F. HAMMER.

The Description, History, Chemistry and Pharmaceutical Record are by JOHN URI LLOYD.

Treatise No. I embraces Thuja Occidentalis.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. III embraces Pilocarpus (Jaborandi).

Treatise No. IV embraces Veratrum Viride.

Treatise No. V embraces Chionanthus Virginica.

Treatise No. VI embraces Asepsin and Asepsin Soap.

Treatise No. VII embraces Collinsonia Canadensis.

Treatise No. VIII will embrace Nux Vomica.

Drug Treatise, Number VII.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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Collinsonia Canadensis.

(STONE ROOT.)

The Name.—This plant has the common names Knob-root, Knob-weed, Rich-weed, Rich-leaf, Horse-balm, and is improperly called Horse-weed, Hard-hack, and Heal-all. It is however best known under the rational name of *Stone-root*, which applies because the root is both very heavy and very hard, the term having been originally employed by the Shakers, who first packed the drug for commerce. Even when green it is as tough as a hickory knot, and when dry it is impossible to powder it by ordinary appliances. The writer has seen Stone-root break a steel mill, while the usual burr-stone mill fails utterly as a pulverizer. Possibly Wild Yam root (*Dioscorea villosa*) parallels Stone-root in toughness. In each case only the modern high speed steel mills are practical as pulverizers, whether the root be green or dry. *Collinsonia* grows in moist woods from Canada to Florida.

History.—The technical name, *Collinsonia*, was given this plant in honor of Peter Collinson,* an enthusiastic English merchant botanist, who, in early years (born 1693, died 1768), took great interest in transporting to England and cultivating new American plants. (See Drug Study No. IV, *Veratrum viride*, "History.") *Collinsonia* was not, however, used in medicine at that early date, nor did it attract the attention of such authoritative observers of the regular school as the Bartons, Dunglison, Zollicoffer and Griffith, probably because it possessed no prominent, poisonous or violent quality to make it conspicuous. However, the bruised leaves have long been used (Lee) in domestic medicine, in form of cataplasm, for bruises and wounds. *Collinsonia* as now employed is one of the drugs exclusively established by Eclectics, with whom it has been in use from an early date. It is increasingly a favorite. The statement found in the first edition of King's Dispensatory (1854) is similar to that in Lee's New York Plants (1848), and also conforms to the various prints and reprints of the early Thomsonian authors as well as those of the early Eclectic school. This statement gave the text for subsequent clinical work of Eclecticism on this drug.

* Peter Collinson was a Quaker philanthropist, a friend of Benjamin Franklin, who served England well both in commerce and science. To him Benjamin Franklin communicated his first essays on electricity, which through Collinson's influence were read before the Royal Society. But alas, "the connoisseurs" did not deem them worthy of publication in the *Transactions of the Society*. Collinson was a liberal patron of the Philadelphia library and a friend to American progress. His special services concerning the introduction of American plants to England continued to near the date of his death, *Veratrum viride* having been transplanted by him in 1768 (see *Veratrum viride*).

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It can not but be regretted that the qualities of *Collinsonia* as now familiar to Eclectic physicians are not better known to the Regular profession, whose interest, as well as that of their patients, would be conserved by such a useful addition to their *materia medica*. But this is also true of many other excellent Eclectic remedies. (See also Drug Study No. V, *Chionanthus*, page 2.)

Part Used.—From the date of the introduction of *Collinsonia* into Eclectic therapy, and until a moderately recent period, preparations of the root only were employed. But in recent years the herb has been commended by some authorities, and judging from the reports concerning it, bids fair to come into general use. (See p. 15.)

Description.—**THE ROOT.**—*Collinsonia* is dark-brown, nearly black, knotty, very heavy, and is covered by a mass of tough, black,



COLLINSONIA CANADENSIS.
[Natural Size of a Small Root.]

wire-like fibers. The green crushed root has a slight, peculiar odor, which disappears on drying. Internally, the dried root is white, odorless, and imparts little taste, even when long chewed. The active principles are very difficult to abstract, whether the drug be finely ground or powdered, its constituents demanding an element of time for their solution, regardless of the menstruum employed.* Either the green or the dried root of *Collinsonia* imparts a deep, red-brown color to

any menstruum that finally abstracts its full qualities. This color arises from the fact that its virtues reside largely in the rootlets, the brown epidermis, and the slightly colored subjacent portions, which must not be excluded if the operator expects to produce a representative preparation. In connection with Professor Scudder, the writer, preceding 1875, experimented persistently with large amounts

*This is an example of the fact that the stereotyped formula of the Pharmacopœia is often inadequate. The element of time is an important factor in the abstracting of many drugs which slowly give up their virtues to a solvent. The equilibrium between drug constituents and solvents is sometimes so nearly balanced as to almost favor the drug attraction instead of the liquid. In such cases prolonged maceration (coaxing) is an absolute necessity, and quick percolation is faulty. Whoever attempts to abstract *Collinsonia* in 48 hours by means of a rational amount of any menstruum is destined to disappointment, as also are physicians using such a product.

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of Collinsonia, and these investigations were continued for many years thereafter. Thousands of pounds of drug were employed, numberless failures resulting, before we became convinced that a menstruum making a light-colored preparation is always objectionable as an abstractor, and that any manipulative method which yields a light, straw-colored liquid is markedly deficient as contrasted with the possibilities of a proper solvent.* We have never known a sophisticant nor an adulterant of Collinsonia root, nor yet any considerable admixtures.

The Herb.—Bruised Collinsonia herb has a peculiar, disagreeable odor, and an acrid taste. It imparts to alcohol a green color and an aromatic flavor. Our preparation has been called "Aromatic Specific Collinsonia," in contra-distinction to the root preparation, which is devoid of aroma. Botanical descriptions of the plant may be found in any botanical treatise on the North American flora.

Constituents.—Collinsonia parallels other vegetable products that as a whole are useful, but in which the isolated structural fragments are not the equivalent of the drug. No definite therapeutical agent has ever been identified in Collinsonia or obtained from it. Mr. Lochman (1885) obtained resin, starch, tannin and wax from the plant, mucilage from the root, and traces of a volatile oil from the leaves, but nothing outside the usual constituents of plants. No alkaloid, essential oil, glucoside, or vegetable acid carrying even an individuality of its own, has been picked out of the drug. In this it differs from *Veratrum viride* (see Drug Study No. IV), which is such a mine of richness to the chemical juggler, yielding a multitude of questionable and mysterious educts. Nor, by reason of its insipidity and its lack of odor, can Collinsonia be classed with such drugs as *Chionanthus*, which, although devoid of chemical equivalents, is yet possessed of strong sensible qualities both of taste and smell. Collinsonia, like Ergot and most other vegetable remedies, is most valuable either as a whole, or in preparations carrying its united qualities. No chemistry, no heroic pharmacy can be tolerated in its manipulation.

Pharmaceutical Preparations.—The pharmacopœia, from its first edition, 1820, has failed to give Collinsonia a place. The dispensaries, except the American, touch it gently, carrying about what Lee of New York wrote in 1848, and he took his brief record from Rafinesque, 1830. None of these parties venture to suggest a

*It does not, however, necessarily follow that a dark preparation of Collinsonia is an authentic representative of the drug. In our experience light-colored preparations are defective, but it can not be claimed that *colored* Collinsonia preparations are by that reason necessarily good remedies. Color is easily supplied if color *only* is wanted.

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formula for a pharmaceutical preparation of the drug. The fluid extract, made by means of any formula whatever, with any menstruum whatever, and out of any kind of Collinsonia, green or dried, fresh or old, is often the only preparation at the command of physicians. Such extracts are naturally of many and different qualities, varying in accordance with all the conditions that govern preparations dominated by such different factors.

The "concentration or resinoid" of Collinsonia is even more uncertain than the extract in that, in addition to the foregoing, we have the effect of heat, the long spell of drying, and the admixture of inert material, whatever it may be, necessary to act both as an absorber and to enable the extract to be powdered and subsequently kept in the form of powder.* It has no intrinsic quality to speak its own praise. This "resinoid" was the cause of an acrid personal discussion between Professors John King and R. S. Newton about 1860. Newton lauded a prescription of the resinoid of Collinsonia and Morphine as a valuable compound. King asserted that the Morphine dominated the mixture, and that the so-called Collinsonin was valueless. It is needless to say that King maintained his stand even in the face of the craze that then existed in behalf of the "new concentrations."

Specific Medicine.—The preparation that is selected by the authors of the papers presented herein as representative of the therapy of Collinsonia is the Specific Medicine, which, as far as is possible, represents the full value of the very best Collinsonia. It has a brown-red color, an insipid taste, and is practically odorless. Added to water it scarcely precipitates, but the aqueous mixture inclines to opalescence. Specific Collinsonia is not to be commended by reason of carrying any one conspicuous chemical constituent or any group of structures. It is simply the result of long applied experimental pharmaceutical care and manipulative study spent in connection with a drug whose very *indifference* and lack of sensible qualities made the satisfactory evolution of a representative product exasperatingly tedious.

Aromatic Specific Collinsonia is a preparation of the flowering top of the green, fresh herb, paralleling in strength that of the root. It has a green color, a not unpleasant fragrance, and a peculiar aromatic taste. It produces a greenish opalescence and a final precipitate, when mixed with water. Its aqueous mixture

*Do not mistake. Such "concentrations or resinoids" as Collinsonin, Cypripedin, Chionanthin, Geranin, Liatrin, etc., indeed the majority of the list, are not definite compounds, nor will any maker of them assert that they have any scientific structural formation. They are even less uniform, less representative, than the commercial fluid extracts of the same drugs, and were relegated to professional oblivion by Eclecticism a quarter of a century ago.

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must therefore be stirred before administration. So far as we know, it is the only representative that has been made of the herb. On it the record of Collinsonia herb in therapy has been established.

THE THERAPEUTICS OF COLLINSONIA.

BY PROFESSOR W. N. MUNDY, M. D., Forest, Ohio.

This plant is known under the various names of stone-root, rich-weed, rich-leaf, knob-weed, horse-balm, horse-weed. The plant is claimed to possess the therapeutical values of an alterative, tonic, stimulant and diuretic.

Its principal therapeutical action seems to be exerted upon the venous system and mucous tissues. This action is largely through the medium of the pneumogastric, the drug relieving the conditions resultant from an irritation of the parts to which this nerve is distributed. In conditions attended with an arterial excitement and cardiac irritation it will overcome this irritation, and it is claimed it is through this same influence that it acts upon the mucous surfaces of the stomach and other tissues of the body.

As a domestic remedy the bruised leaves have been used as a poultice in bruises, ulcers and sprains, and internally for various abdominal ailments.

The Specific Medicine Collinsonia we have used in various ailments for the past twenty years with considerable satisfaction. In studying its therapeutical properties there are three strongly distinctive indications which have served us as a sign-board for its internal administration. They are briefly: Congestion, Irritation and a sense of Constriction. This trinity of indications is characteristic, and easily remembered. Though these as a rule are sufficient, to them a fourth can be added with profit, namely, hemorrhoids. This latter condition as a rule results from the first and second named, and all three are frequently due to a congestion of the portal system, upon which system Hale claims the remedy has a special action.

Its action as a tonic is upon the enfeebled muscular tissue, and from this action the remedy has a distinct ability to overcome relaxed and atonic conditions of the heart muscles and walls of the veins and capillaries.

We esteem Collinsonia one of the best remedies we possess in chronic catarrhal diseases of the mucous tissues of the pharynx, naso-pharynx and larynx. In selecting it as a remedy in these diseases we follow the indications enumerated above, congestion, irritation

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and a sense of constriction. We find that chronic laryngitis, pharyngitis, and some forms of chronic bronchitis respond promptly to its therapeutic action. One of the most marked results in chronic catarrhal pharyngitis we ever witnessed resulted from the internal administration of Specific Collinsonia, uncombined with other remedies, save only the vehicle, simple syrup.

The conditions calling for its administration are a relaxed condition of the mucous tissues of the pharyngeal walls; they are of a dark red color, and show evidences of an enfeebled capillary circulation.

Collinsonia has long been a popular remedy for that condition of the larynx known as "Minister's Sore Throat." This condition usually results from a prolonged and excessive use of the voice in a strained or unnatural key. The result is a congestion or hyperæmic condition of the vocal organs. This produces aphonia, cough, and a sense of constriction, which is promptly relieved by this remedy. It relieves the congestion and gives tone to the enfeebled organs.

It is also an excellent remedy in the following diseases of the digestive system: chronic gastritis or indigestion, where the circulation is defective and digestion is attended with pain and nervous symptoms occurring before meals; also when in addition to the derangement of digestion there is a congestion of the liver and a tendency to hemorrhoids.

In the early stages of diarrhœa and some cases of dysentery Collinsonia is a good remedy, as well as in flatulent, biliary and infantile colic. Dr. John V. Shoemaker in *Sajous Annual*, 1888, ascribes to this remedy antispasmodic properties and prescribes it in gastralgia, where morphine and belladonna afford but temporary relief. Postle in the *Ohio Transactions* for 1902, page 122, says it is good in congestion and irritation of the mucous membranes, be it in the mouth, throat, lungs, kidneys, urethra or rectum. He warmly advocates it for nurse's sore mouth, esteeming it above any other remedy. The conditions calling for it are the same as elsewhere, namely, a reddened, irritated and congested mucous membrane of the mouth and throat.

Of all the internal remedies for hemorrhoids, it is without doubt the best. We have frequently prescribed it with success and we find upon investigation that many, in fact all, writers upon the remedy, to which we have access, accord to it the same value we do in hemorrhoidal conditions. It is indeed one of the pronounced indications for the remedy. Hemorrhoids frequently result from a derangement of the portal circulation. Hale says it has a special action upon this circulation; hence its value in congestion of the

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liver and its circulatory apparatus. Not only is it of value in hemorrhoids, but it relieves spasms of the sphincter ani, proctitis, prolapsus ani, and many of the vague pelvic and abdominal symptoms due to these conditions. It is in these conditions Shoemaker advises the use of suppositories made from the powdered root. It not only relieves these conditions, but frequently alleviates many of the reflex disorders induced by them, such as cough, asthma, chorea, headache and cardiac distress. We do not pretend to say it cures these diseases, no matter what may be the cause, but we desire it to be understood that it is only when they arise as reflex disorders from certain forms of rectal irritation which convey the indications as above enumerated. In the conditions named we have clearly before us the indication, hemorrhoids and constipation, due to vascular engorgement of the pelvic viscera. A sense of constriction, heat and weight in the rectum, with dry, scybalous fæces.

In genito-urinary difficulties Collinsonia has also some therapeutic value. In incontinence of urine it often relieves when other measures fail. Shoemaker, quoted above, administers it after supper and at bed-time for this difficulty. In vesical and urethral hyperæsthesia and calculous affections it is also of considerable value.

In the National Transactions for 1899-1900, Dr. Hogan recommends it as a topical application in dysmenorrhœa and chronic endometritis. It is also of considerable value in amenorrhœa and leucorrhœa when administered internally. This therapeutic value is no doubt due to its action upon the mucous surfaces.

As has been stated, it has considerable influence upon the pneumogastric, hence its use in some forms of functional heart difficulties, such as irregularities, especially when they are dependent upon hysteria or chlorosis.

The fact is apparent from what has been stated that the medicine is of value in congestion and irritation of the mucous membranes, no matter where located.

The indications for its use will be enumerated again without fear of being tedious. A sense of constriction with irritation in the throat, larynx or anus. A sense of constriction with tickling in the throat, with a cough arising from the use of the voice. A sensation as if a foreign body were lodged in the rectum, with contraction of the sphincter and a contracted and painful perineum. Sticking pains in the larynx, heart or bladder, vesical tenesmus. Our personal selection of the remedy is based, as we have noted above, upon the trinity—congestion, irritation, and a sense of constriction; these combined with a hemorrhoidal tendency or condition form a com-

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bination which points to the selection of this remedy with a positiveness that amounts to almost a certainty.

DOSAGE:—As a remedy in catarrhal affections of the throat we use Specific Collinsonia, half ounce or ounce; simple syrup or water, four ounces; teaspoonful to a dose. In hemorrhoidal conditions the dose is smaller. Half drachm Specific Collinsonia to a four ounce mixture. Dose, a teaspoonful.

Therapeutic uses of Collinsonia, from the writings of physicians who employ it.

Collinsonia Physiological Action.—Collinsonia stimulates the stomach, promoting its own absorption. It is actively tonic in its influence on the entire function of this organ, and from this influence its beneficial action is exercised upon the functions of all the vital organs.

Collinsonia acts as a tonic to enfeebled muscular structure of the heart. It is conspicuous in its ability to overcome relaxed and out of tone conditions of the walls of the veins. It has a direct influence upon atonic or dilated or otherwise impaired conditions of the veins and venous capillaries.

Specific Symptomatology.—In *piles* with a sense of fullness, or of a foreign body in the rectum, in all relaxed conditions of the mucous membranes of the lower bowel, Collinsonia is the remedy. It works more promptly if there is passive congestion with blueness or dark discoloration of the membranes, showing imperfect venous capillary circulation.

Therapy.—It is a specific remedy for hemorrhoids. If they are of recent origin, they can be cured in from three days to a week with this agent. The most intractable cases will be relieved and permanently benefited by its persistent use.

In *catarrhal gastritis*, where the circulation is defective, Collinsonia, either alone or combined with hydrastis, is of first importance. These agents combined improve the tone of the stomach, strengthening its walls and its mucous membranes, and increasing the strength and character of its glandular structure. They increase the appetite and greatly improve the digestion and assimilation of food.

This combination is a superb general tonic in relaxed and debilitated conditions, and combined with iron can hardly be excelled.

Acute inflammations do not readily yield to Collinsonia, although it is an excellent auxiliary to the indicated treatment.

When piles are operated upon, this remedy may be given before and after the operation to advantage. The author has cured many cases by equal parts of Collinsonia and Hamamelis Virginica, giving twenty to thirty drops of the mixture every two hours. Distilled hamamelis can be injected into the rectum, or kept in contact with the external piles by a compress, especially during sleep. Or an occasional application of the liquor of the persulphate of iron in full strength can be made to stubborn external piles. Collinsonia is of great value in the hemorrhoids of the pregnant female, with imperfect venous circulation in the pelvic viscera.

Pain in the rectum from whatever cause, especially pain not attributable to a definite cause, and pain after surgical operations, is quickly and more or less permanently relieved by Collinsonia. In pain in the lower bowels, persistent and steady, Collinsonia is specific. Either single full doses, or doses of five minims of the Specific Medicine every ten minutes, should be given in water.

It is recommended as a remedy for diseases of the bladder, but it could hardly be of service unless in case of over-distended, relaxed and enfeebled walls, and

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muscular stricture of this organ with imperfect capillary circulation, perhaps accompanying hemorrhoids.

Collinsonia is a *heart tonic* of direct and permanent influence. It does not seem to stimulate the heart to sudden action, but its continued use induces steady, permanent and highly satisfactory improvement in the strength and character of the organ, and a correspondingly improved general circulation.

It is valuable when the heart is debilitated from protracted fevers, or from *rheumatic inflammation*, or from overstrain. It will be found excellent in the bicycle heart, in conjunction with small doses of *cactus grandiflorus*.

In *chronic laryngitis or pharyngitis*, with relaxed walls of the larynx or pharynx, with dark discoloration and enfeebled capillary circulation, Collinsonia exercises a prompt and direct influence, especially in the condition known as *clergyman's sore throat*, caused or increased by the use of the voice.

In atonic conditions of the circulation of a local character, where *passive hemorrhages* are of frequent occurrence without apparent cause, where there is increasing debility, Collinsonia and hamamelis in conjunction given as above indicated are positive curatives.—*Webster, Materia Medica and Therapeutics*.

Collinsonia Canadensis.—Collinsonia is specific in minister's sore throat; administered in the proportion of: R. Specific Collinsonia, fl. ʒ ss; simple syrup, fl. ʒ jss. Half teaspoonful to a teaspoonful four times a day.

It proves beneficial in other cases of chronic laryngitis, in chronic bronchitis, and phthisis, allaying irritation, and checking cough.

It also exerts a favorable influence upon the digestive processes, improving the appetite, facilitating digestion, and acting as a general tonic.

It passes off through the kidneys, and exerts a tonic influence upon the entire extent of the urinary tract.

I have thought that its influence was specially exerted upon and through the *pneumogastric*, relieving irritation of, and giving strength to parts supplied from this source.

Collinsonia is specific in the early stages of hemorrhoids, and will sometimes effect a cure in the advanced stages of the disease. In this case it is employed in small doses: R. Specific Collinsonia, gtt. x; water, ʒ iv. A teaspoonful four times a day.

I have given the therapeutics of Collinsonia thus briefly, that the points named might make the greater impression upon the reader. I regard it as one of the most direct and valuable agents of the materia medica, and one that will give satisfaction to whoever employs it.—*Scudder, Specific Medication*.

Collinsonia.—This is the remedy for hemorrhoids, with a sense of heat, burning or constriction in the rectum. It is a remedy for diseases of digestion, functional diseases of the urinary apparatus, and diseases of the reproductive organs, if the above symptoms are present. It is a remedy in diseases of the respiratory apparatus, when the irritation points in the larynx, with change in the voice, or inability to use it without irritation. Add gtt. v to xx to water ʒ iv; a teaspoonful every two to four hours.—*Scudder, Specific Medication, page 402*.

Collinsonia Canadensis.—This old remedy occupies an important place in our materia medica. New remedies have supplanted many of our older remedial agents, but Collinsonia, in certain diseases, is still without a rival, and the wrongs over which it possesses a curative power are numerous, and cover a wide range of abnormal conditions.

Collinsonia Canadensis, commonly known as stone-root, ox-balm and several other local names, is usually found in rich, moist woods, from Canada to Florida. It grows from two to four feet in height, and has thin leaves from six to eight inches

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in length by three or four inches in width. The root, which contains its most active medicinal properties, is from three to six inches in length, and covered with stem scars, giving it a knotty appearance.

In catarrhal conditions of the respiratory mucous membrane, most speedy and beneficial results are obtained from the timely exhibition of Collinsonia. The cough of consumptives is greatly lessened by its use, as is also that caused by excessive use of the voice. In the chronic form of laryngitis, commonly known as minister's sore throat, it is a superior remedy when administered in medicinal doses. The prescription in this troublesome affection should be as follows :

R Specific Collinsonia, - - - - - 3 ij.
Simple Syrup. - - - - - q. s. ad 3 iv.
M. Sig. One teaspoonful every three or four hours.

The uniform and powerful action of Collinsonia upon the mucous membrane of the throat is also manifested in its curative influence in follicular pharyngitis and chronic bronchitis. In these conditions the dose should be from two to five drops of the Specific Medicine every two to four hours.

The tonic action of this drug upon the heart is direct, decided and permanent. It is one of our most efficient remedies when the heart is debilitated from long-continued disease, and especially in protracted rheumatic troubles. It relieves the irritation of the heart, and increases its power and regularity of contraction. In mitral regurgitation it may be administered with confidence in its modifying power. In all functional wrongs of the heart its tonic influence is promptly made apparent. In doses of from two to five drops of the Specific Medicine it almost invariably relieves the distressing cough which frequently accompanies diseases of the heart.

Collinsonia has a specific action upon the vascular system, and the power of the capillaries is markedly increased under its influence. In passive hemorrhage, when the capillary circulation of the part involved is enfeebled, it exerts a speedily manifested controlling influence, and in all conditions showing a lack of tonicity of the walls of the blood-vessels it is specifically indicated. This power of increasing the tone of the circulatory system makes it an energetic remedial agent in many cases of dropsy. The dose employed in these conditions should be ten drops of the Specific Medicine every two or three hours.

In atonic states of the stomach Collinsonia constitutes a medicament which gives most satisfactory results, and is especially indicated in catarrhal gastritis when the circulation is defective. In bowel affections it soothes and heals, and gives tone to the intestinal mucous surfaces. It is therefore an agent of much value in many cases of diarrhoea and dysentery.

In hemorrhoids Collinsonia is our most efficient remedy, and will cure all cases susceptible to therapeutic action. Perhaps I can more clearly present its wonderful power over this abnormal condition, and at the same time more forcibly impress upon the mind the indications here calling for exhibition, if I briefly report a case occurring in my own practice. A feeble woman, about fifty years of age, consulted me in reference to hemorrhoids which had caused her much suffering for many years. She had recently consulted a surgeon who advised an operation, and another doctor told her he could speedily remove the affliction by injecting the tumors with a mixture of carbolic acid and sweet oil. An examination revealed numerous small piles protruding and displayed within the rectum largely dilated veins. She suffered from an almost constant sensation of some foreign body in the rectum, and a contraction of the sphincter, which at times became very painful.

I told her that her health was not such as to justify an operation, and that in view of the many dilated veins, the injection suggested would be somewhat

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dangerous, as a clot might possibly form and be forced into the portal circulation and cause embolism of the liver. On being assured that a considerable relief from her sufferings could be obtained by the judicious and continued use of medicine, she decided to place herself under my treatment. I gave her a vial of Specific Collinsonia and directed her to add ten drops of the medicine to thirty teaspoonfuls of water and take one teaspoonful of the dilution every two hours. I also gave her a weak solution of the persulphate of iron, to which was added an equal quantity of the tincture of opium, and advised her to use the combination twice a day as a local application. This treatment was continued for six months, at which time the protruding piles had disappeared and the dilated veins had resumed their normal state.

The hemorrhoids of pregnant women, caused by imperfect venous circulation of the pelvic viscera are also subject to its control, and the unpleasant condition which gives a sense of constriction, weight and heat in the rectum, from which many child-bearing women suffer severely, yields with reasonable promptness to its soothing influence. Most pains in the rectum, when not caused by organic change, come within its healing properties. In all rectal diseases the small dose gives the best results.

Collinsonia exerts a tonic action upon the entire urinary tract, and in most diseases of the kidneys and bladder its curative power is quickly manifested. Under its influence the secretion from the kidneys is considerably augmented, and dropsical fluids removed. In catarrhal affections of the kidneys, bladder and entire genito-urinary organs, this drug will aid much in bringing about a complete recovery.

Collinsonia has a direct and stimulating action upon the absorbent system and mucous membranes, and is, therefore, of great usefulness in diseases of the glandular system. Its beneficial effect in dropsies is in no small degree owing to its stimulating influence upon the absorbent system. In wrongs of this nature it should be administered in doses of from five to ten drops of the Specific Medicine every two or three hours until the system is brought under its control, and then continued in medium or even small doses three or four times a day.

Collinsonia is a tonic, stimulant, astringent, diaphoretic, diuretic and alterative. In very large doses it is irritant and emetic.

The most prominent specific indications for Collinsonia are as follows: Irritation, with a sense of constriction in the larynx; oppression with tightness in the epigastrium; painful constriction in the rectum; hemorrhoids with constriction of the sphincter, and a sense of a foreign body in the rectum; passive congestion with dark discoloration of mucous membrane; relaxed condition of mucous membranes, especially of the lower bowel.

The dose of Collinsonia is ten drops of the Specific Medicine, but in many cases the best effect can be obtained by adding ten drops of the Specific Medicine to four ounces of water and administering one teaspoonful of the dilution every hour to every two or three hours.—*John W. Fyfe, M. D.*

Collinsonia is a very good alterative in chronic diseases of the urinary organs, acting specifically in many instances, in dropsy, calculous affections, etc. It has a good influence on the digestive process and improves the appetite. It relieves irritation of the mucous surfaces, especially of the pelvic viscera. It is valuable in atonic dyspepsia, and is specific for hemorrhoids with a constant sensation of some foreign body in the lower bowels. In atonic dyspepsia with constipation, good results may be expected from it. It is especially good if hemorrhoids are also present. It relieves hemorrhoids in the pregnant female. Use it

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in dysmenorrhœa, leucorrhœa, and prolapsus uteri, if there be hemorrhoids associated with these disorders. For these hemorrhoidal and other rectal disorders the small dose acts better than the large one. As a rule give the following :

R. Specific Collinsonia, - - - gtt. x. to xv. or xxx.
Aqua, - - - - - fl $\frac{3}{4}$ iv.

M. Sig. Dose, from one-half to one teaspoonful every three hours.

This agent has a specific influence on the tissues and valves of the heart, hence it becomes very valuable in some heart troubles. For rheumatic carditis it is a very reliable remedy. It is also valuable in chronic inflammation of the pericardium, giving rise to dropsical effusions. It is claimed to be an absolute specific for minister's sore throat, and in chronic disease of the larynx, bronchi, etc., checking the cough and disease. For the throat trouble give it much stronger than recommended for hemorrhoids.

R. Specific Collinsonia, - - - - - fl $\frac{3}{4}$ ss.
Simple Syrup, - - - - - fl $\frac{3}{4}$ iss.

M. Sig. Dose, from one-half to one teaspoonful every three hours.

Use the remedy in spermatorrhœa accompanied with hemorrhoids. Owing to the fact that it does not derange the stomach, it is an excellent remedy.—*Extract from Locke's Materia Medica and Therapeutics.*

Collinsonia is said to be alterative, tonic, stimulant and diuretic. It acts principally on the venous system and mucous tissues, and undoubtedly has a marked action on the vagus, relieving irritation in parts to which that nerve is distributed. Small doses of the green plant will promptly provoke emesis. It has long been a popular domestic remedy for various disorders. The bruised leaves were applied as a poultice in burns, bruises, wounds, sores, sprains, and for internal abdominal ailments. The root was used in female complaints, piles, urinary diseases, and gastro-intestinal affections.

The remedy has been used with varying degrees of success by the profession in female disorders, amenorrhœa, dysmenorrhœa, menorrhagia, vicarious menstruation, prolapsus uteri, leucorrhœa, threatened abortion, and pruritus vulvæ, dependent on varicosis.

Stone Root being diuretic and tonic, was formerly much used in genito-urinary troubles. It was highly thought of in a calculous diathesis. While very much overrated, it is probable that it was not without beneficial results in toning up the renal organs and allaying irritation consequent upon the presence of gravel. It is certainly a good remedy in vesical catarrh. Good results have come from its employment in spermatorrhœa and varicocele, when accompanied by piles.

Catarrhal conditions, whether of renal, vesical, or genito-urinary organs, or of the respiratory mucous surfaces, are speedily benefited by it. Even the cough of phthisis is rendered much less harassing by its administration.

One of the first uses of Collinsonia by Eclectics was in the treatment of that form of laryngitis known as "minister's sore throat." For this condition it is the best agent we possess. It is equally valuable in other forms of chronic laryngitis, pharyngitis, and in some cases of chronic bronchitis, and trachitis. It is an excellent remedy for aphonia, resulting from vascular hyperæmia, or from congestion. In throat troubles,

R. Specific Collinsonia, - - - - - 3 ii.- $\frac{3}{4}$ j.
Simple syrup, q. s., - - - - - $\frac{3}{4}$ iv.

M. Sig. Teaspoonful every three or four hours.

In diseases of the gastro-intestinal tract, it is beneficial in relieving the irritation, improving the appetite, promoting the flow of gastric juice, and in exerting

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a decided tonic effect upon the organs involved. It is more clearly indicated when piles are present as a complication. It is a good remedy in indigestion, irritative dyspepsia, chronic gastritis, chronic gastric catarrh, diarrhœa, dysentery colic, and spasmodic conditions of the stomach and intestines. By its tonic action upon the bowels, it is a valuable remedy for constipation. Perhaps one of the most direct indications for Collinsonia, is a hemorrhoidal and constipated state due to vascular engorgement of the pelvic viscera. The most marked symptoms calling for it will be a sense of constriction, heat and weight in the rectum, with dry, scybalous feces. Under these conditions the remedy gives marked relief, especially so in pregnant women. In rectal ailments give the small dose,

R. Specific Collinsonia, - - - - - gtt. x-xv.
 Aqua, - - - - - 3 iv.
 M. Sig. Teaspoonful every three or four hours.

Collinsonia acts upon the tissues and valves of the heart, relieving irritation, increasing its power to act, and regulating its contractions. It is a serviceable drug in hydropericardium, rheumatic heart troubles, and functional disturbances due to irritation of the stomach. Mitral regurgitation and the distressing cough of heart disease, are greatly benefited by its administration. R. Specific Collinsonia gtt. iij every hour. Lack of tonicity of the blood vessels is overcome by Collinsonia. In short, passive vascular engorgement with dilated capillaries, torpid portal circulation, and lack of muscular tonicity, call for stone root. The keynote is a *sense of weight and constriction* in the part affected. The dose should vary from one-tenth drop to fifteen drops Specific Collinsonia; the smaller dose being preferable in hemorrhoids. Prof. Scudder points out as indications for this drug, "a sense of constriction, irritation in throat, larynx or anus, with tickling in throat, with cough arising from use of the voice; a sensation as if a foreign body were lodged in the rectum, with contraction of sphincter; and contracted and painful perineum."—*H. W. Fetter, M. D., in The Medical Gleaner.*

Collinsonia.—This is not one of the newer remedies, but it is an efficient one nevertheless. Under old methods Collinsonia has been variously classified. It has been called a tonic, a diuretic, an astringent, a diaphoretic, an alterative, a stimulant, a carminative, a discutient, etc. Had we nothing but these names to guide us to a practical use of this, or in fact any other drug, there certainly would be room for guess-work. The fact that a drug is "said to be good" for such and such diseases, does not avail us much.

The Eclectic finger-boards pointing to the use of Collinsonia are few, but they are positive, and our experiences with the drug, based upon these indications, are sufficiently satisfactory to warrant us in not only recommending it, but in urging JOURNAL readers to its use. The late Prof. J. M. Scudder said of Collinsonia: "I regard it as one of the most direct and valuable agents of the materia medica, and one that will give satisfaction to whoever employs it." The only qualification that we would attach to this declaration is, that a fresh and reliable preparation of the drug must be used.

The indications pointing to the use of Collinsonia may be summed up in a very few words. They are *congestion, irritation, with a sense of constriction*, and its application as a remedy is beneficial, no matter what part of the digestive tract is most disturbed. The above indications are frequently pronounced in diseases of the throat or larynx, diseases of the stomach, and in diseases of the rectum and anus. Besides, we believe that through its general tonic affect, Collinsonia markedly benefits chronic disturbances of the genito-urinary organs.

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AROMATIC SPECIFIC COLLINSONIA.

BY PROFESSOR KENT O. FOLTZ, M. D., Cincinnati, O.

Regarding the use of Aromatic Specific Collinsonia would say that my attention was first called to the preparation of the flowering top of Collinsonia by Professor H. T. Webster, M. D., of Oakland, California, in the summer of 1890. My father, Wm. K. Foltz, M. D., has made use of it for the last five years. He states that in many conditions he prefers it to the root preparation. He says:

"My experience with 'Aromatic Specific Collinsonia' has been very satisfactory in diseases of the respiratory passages, especially in pharyngitis, laryngitis and bronchitis. In rectal and cystic diseases it is a favorite remedy. It may be given with most confidence wherever there is vascular disturbance of the mucous surfaces with marked venous congestion, whether acute or chronic. In pharyngolaryngitis I consider it specific. With the above indications I prefer Aromatic Specific Collinsonia to that of the root, and now invariably prescribe it as giving better and quicker results.

"I am inclined to the opinion that the aromatic principle in the green plant is an important remedial agent which does not exist in the root. My use of the drug has been mostly along the line indicated, and has been so uniformly good that I seldom think of any other except the associate remedy."

My own experience with the drug has been mainly with laryngeal diseases, especially where hoarseness and tickling in the larynx were present, the result seeming much more satisfactory than with the preparation made from the root. The indications for the use of the drug I have found no different than from those given for the Specific Medicine now in the market, the results, however, have been much more satisfactory

From Dr. George P. Burtchby, who for years has used large amounts of Aromatic Specific Collinsonia.

Aromatic Specific Collinsonia has served me well. I have used it in diseases of the stomach with an irritable heart; wrong coming through the pneumogastric nerve; laryngeal irritation, with hoarseness or loss of voice; pain in hypogastrium, when of rectal origin; functional heart troubles, and chronic inflammation of pleura. The place in which this new preparation of Collinsonia has been of most use to me is in laryngeal troubles and diseases of the stomach, with enfeebled enervation and functional heart troubles. The dose I use is as follows: j to ij z of Aromatic Specific Collinsonia to iv z water. Teaspoonful of the mixture every hour in acute troubles; every three or four hours in chronic cases.

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Indications and Uses of Specific Medicine Collinsonia.

This is the remedy for hemorrhoids, with a sense of heat, burning or constriction in the rectum. It is a remedy for diseases of digestion, functional diseases of the urinary apparatus, and diseases of the reproductive organs, if the above symptoms are present. It is a remedy in diseases of the respiratory apparatus, when the irritation points in the larynx, with change in the voice, or inability to use it without irritation.

For the latter purpose no remedy has exceeded Collinsonia in that form of laryngeal irritation and sub acute inflammation known as "minister's sore throat"—chronic laryngitis. It is the remedy for hoarseness in those who speak or sing for a livelihood, such hoarseness being due either to vascular hyperæmia or to congestion. The small dose is most effectual in hemorrhoidal troubles while in laryngeal affections large doses are required.

Indications and Uses by J. M. Scudder, M. D.

Indications.—Sense of constriction, with irritation in throat, larynx or anus.

Use.—In minister's sore throat; in chronic laryngitis, chronic bronchitis, and some cases of gastric disease. It allays irritation in some cases of urinary disease. A specific in hemorrhoids when the above indications are present.

Dose.—R. Collinsonia, - - - - - $\frac{3}{4}$ i.
Simple Syrup, - - - - - $\frac{3}{4}$ iij.
M. A teaspoonful four times a day.

For the last use

R. Collinsonia, - - - - - gtts x.
Water, - - - - - $\frac{3}{4}$ iv.
M. A teaspoonful of the dilution four times a day.

PRICES OF COLLINSONIA PREPARATIONS. Specific Medicine.

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JUNE, 1904.

LLOYD BROTHERS, Cincinnati, Ohio

A TREATISE

ON

NUX VOMICA.

The Therapeutic Uses are written for this Treatise by **PITTS EDWIN HOWES, M. D., Boston, Mass.**

The Reproductions are from the writings of

A. F. STEPHENS, M. D., A. S. BRECOUNT, M. D.,
C. W. PAGEL, M. D., W. N. MUNDY, M. D.

The Illustrations (C) are drawn for this Treatise by **Mr. W. F. HAMMER.** and (A and B) from **Bentham and Hooker, Medicinal Plants.**

The Description, History, Chemistry and Pharmaceutical Record are by **JOHN URI LLOYD.**

Treatise No. I embraces Thuja Occidentalis.
Treatise No. II embraces Cactus Grandiflorus.
Treatise No. III embraces Pilocarpus (Jaborandi).
Treatise No. IV embraces Veratrum Viride.
Treatise No. V embraces Chionanthus Virginica.
Treatise No. VI embraces Asepsin and Asepsin Soap.
Treatise No. VII embraces Collinsonia Canadensis.
Treatise No. VIII embraces Nux Vomica.
Treatise No. IX will embrace Gelsemium.

Drug Treatise, Number VIII.

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Nux Vomica.

Common Names.—Nux, Poison Nut, Dog Button, Vomic Nuts. The bark has been sold as *False Angustura*, and deaths have occurred in consequence.

Strychnos Nux Vomica.—The tree that yields this drug is of moderate size, and is indigenous to tropical India and adjacent islands. Its nearest relative in the United States is *Spigelia Marilandica*, the little plant which yields Pink-root. The wood of Nux Vomica is close-grained and bitter, and from a very early date has been used as a tonic by the natives of its habitat, by whom it is still employed in this manner. Under the old name "*Lignum Columbrinum*," the wood of this and related trees is valued by the natives of India as an antidote to the bite of the venomous serpent, cobra. The trunk is short, thick, crooked. The branches are ash colored, the young shoots highly polished. The fruit is about the size of a

small orange, yellow and acidulous. It contains a white edible pulp, which is eaten by children and many birds. In this pulp are imbedded, irregularly and vertically,



A.—FRUIT OF STRYCHNOS NUX VOMICA.
Reduced.



B.—TRANSVERSE SECTION OF FRUIT AND SEEDS
OF STRYCHNOS NUX VOMICA. Reduced.

from one to five disc-like seeds, which are intensely poisonous in character. (See cuts A and B.)



C.—SEEDS OF STRYCHNOS NUX VOMICA. Slightly reduced.

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Nux Vomica.—These button-like seeds (not nuts) are about an inch in diameter by one-fourth inch thick, the center portion being usually depressed. (See cuts C.) They are mouse colored or greenish, and lustrous by reason of a silky covering of adpressed glistening hairs. They are albuminous, very hard, tough, horny, and extremely bitter. They are not easily powdered, unless previously softened by steam. Maceration in water, especially hot water, softens the albumen, after which transverse slicing of the seed displays a mass of cartilaginous albumen, divided into two bean-like parts, between which lies the germ. These seeds are exported in immense quantities, thousands of tons being respectively consigned to England, the Continent, and America. From Nux Vomica is made the bulk of the Strychnine and Brucine of commerce, although St. Ignatius Bean yields a greater proportion of each alkaloid. In this connection it may be said that it has been erroneously reported that Nux Vomica is a medicinal product of the Philippines. The Philippine tree is, however, St. Ignatius.

In consequence of its poisonous nature, Nux Vomica was very reluctantly introduced into the European pharmacopœias. Indeed, it was recognized in America (1830) before it was official in England, although long before this date it was a dispensatory drug. In 1799, however, it was official in the Pharmacopœia Borussica, and in two other Continental European pharmacopœias.

Composition.—The dominating constituent of Nux Vomica is a complex compound which, in natural form, is an invaluable remedy. By means of chemical reagents it can be split into parts, embracing two intensely poisonous alkaloidal products, a glucosid, and acids. These alkaloids are Strychnine, Brucine, and perhaps Igasurine (yet in doubt). The main acid is Igasuric Acid, while the glucosid is named Loganin. These are all colorless bodies, the alkaloids being very bitter, and energetically poisonous, Brucine being a poison similar to Strychnine, acting with less violence and more slowly, but not less surely, than Strychnine.

Nux Vomica is an invaluable remedy in the therapy of each of the schools of medicine. Although first a favorite of the Regular school, to whom credit for its introduction is herein extended, it has come into great repute with both the Homœopathic and Eclectic schools, where it has received extended independent study, being one of the first in importance of all the Eclectic remedies.

Although the alkaloids of Nux Vomica have decided values and are energetic poisons, they are recognized by experienced practitioners as presenting but a fragment of the possibilities of the entire drug; especially is this the case in the therapy of the two latter

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named schools, whose provings have been made with exceptionally exact natural preparations, embodying the full drug value of Nux Vomica. (See remarks by Dr. Pitts E. Howes, p. 10.) In this connection, physicians in active practice and versed in clinical differentiation are aware that the natural Nux compound, whatever it may be, exhibits a kindliness, a protracted influence, and a uniformity of therapeutic action, impossible to parallel by means of either of the quick-shocking artificial substances (Strychnine or Brucine) that result from the chemical destruction of the natural structure that dominates Nux Vomica. This fact has led to the valuation of Nux *as such* in disease expression, whereas the reports that concern its ultimates, the poisonous alkaloids, are based largely on their intense physiological action on cats, dogs and other animals, in health.

Strychnine.— $C_{21}H_{22}N_2O_2$. This violently poisonous alkaloid is crystalline, slightly soluble in cold water (1 part in 6700 U. S. P.), the solution being alkaline and bitter. It dissolves in 7 parts of chloroform and 150 parts of 90% alcohol. Strychnine is a terrible tetanic poison, affecting the cerebro spinal system, but it kills without producing marked anatomical change, the muscles and nerves being scarcely altered, although the brain and spinal cord may be congested, stomach and limbs intensely congested, right side of heart gorged (sometimes empty), and the lungs congested. The fatal dose of Strychnine is as low as $\frac{1}{2}$ grain. Indeed, it is recorded that $\frac{1}{4}$ grain killed a two-year old child in four hours, while $\frac{1}{2}$ grain killed a man in twenty minutes.

Incompatibles.—Alkalies, iodides and bromides throw Strychnine from solution, the soluble bromides being especially dangerous because of their gradual change, which finally results in the precipitated bromide of Strychnine being given in one dose. For this reason, Nux Vomica preparations and solutions of its alkaloids should not be compounded with the above named substances, unless particular pains are taken to shake the mixture well, before each dose is taken.

Strychnine is absorbed by the blood, and circulates as such. It is eliminated unchanged in the urine, but is excreted very slowly, and therefore accumulates in the system. The fact that this powerfully poisonous alkaloid is so often used with criminal intent, and may be so easily administered imprudently by physicians, thus finally getting its cumulative poisonous effect, induces us to devote to it extra space, and to exercise greater care in cautioning our readers concerning its abuse, than we should were it an innocuous substance likely only to prove a disappointment in therapy, as is true of so

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many other so-called proximate principles, when contrasted with the action of the drug yielding them. We therefore present the following exceptionally lucid treatise concerning its toxicology:

Toxicology.—"In about an hour after a poisonous dose of Strychnine, the patient begins to feel uneasy from a sensation of impending suffocation. The tetanic convulsions then commence with great violence, nearly all the muscles of the body being affected at once. The limbs are thrown out, the hands are clenched, the head is jerked forwards and then bent backwards, and the whole body is perfectly stiff from the violence of the contractions. The pulse is very rapid; the temperature may rise. Hearing and sight are acute. The convulsion lasts a minute or two, then the muscles relax, and the patient feels exhausted and sweats all over. The intermission is short, convulsions soon come on again, and again there is a relapse to the state of muscular relaxation. The convulsions now rapidly increase in severity; and owing to the violent contractions of the muscles of the back, the patient is in the position of opisthotonos, resting on his head and his heels. The abdominal muscles are as hard as a board, the chest is fixed, the face becomes livid, the eyeballs are staring. The contraction of the muscles of the face causes a *risus sardonicus*; but those of the jaw are not affected till quite the end. Consciousness is retained to the last. The slightest noise or even a bright light will reflexly bring on the convulsions, which may jerk the patient out of bed. Ultimately he dies from exhaustion and asphyxia. The smallest dose of Strychnine known to have killed an adult is half a grain. *Post mortem.*—The usual appearances of death by asphyxia are seen."—*W. Hale White's Materia Medica and Therapeutics, 1901.*

Treatment.—If spasms have not closed the jaws, use the stomach pump at once. Employ emetics cautiously and discriminatively. Dr. Charles Rice, chemist of Bellevue Hospital, once wrote us that he had seen fatal convulsions follow the administration of an emetic, which seemed by its shock to produce death, and he opposed the use of emetics if it is possible to avoid them. However, if the Strychnine be not removed, death is as certain as from the shock of convulsion. Put the patient immediately under the influence of chloroform or ether, and keep him in perfect repose in a dark room. Inject large doses of potassium bromide and chloral hydrate *per rectum*. Use no stimulants and make no noise, avoiding whispering even, or feeling the sufferer's pulse. Chemical substances, such as tannin, simply retard alkaloidal absorption without decreasing the final lethal action of the drug. Physiological antidotes, or antagonistic poisons, such as chloroform internally; chloral by the rectum; morphine, physostigmine, and aconitine, hypodermically, sometimes delay death, or in case of small doses of the poison, help to bridge the patient over the critical period. But if enough Strychnine has been swallowed they can not save life unless the stomach be cleaned of the poison. A favorite treatment in Strychnine dog poisoning is to drench the dog freely with large amounts of melted lard, which acts both as an emetic and to envelope the Strychnine, thus retard-

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ing absorption. We have no record of this treatment having been used, even as an emergency, in humanity.

Brucine.—This related alkaloid is also a product of chemical action on Nux Vomica. It is known to chemists as dimethoxyl-strychnine $C_{23}H_{26}N_2O_4$. Brucine is very bitter, freely soluble in cold alcohol, soluble (U. S. P.) in 850 parts of cold water. It differs in reaction from Strychnine in that strong sulphuric or nitric acid strikes with it a blood-red color, whereas with Strychnine no coloration appears.* If to a hydrochloric acid solution of Brucine and Strychnine, potassium ferrocyanide solution be added, the Brucine precipitates, while the Strychnine remains dissolved. The mixed alkaloids can be quite closely separated by alcohol 0.97 sp. g., which freely dissolves Brucine, but scarcely dissolves Strychnine.

Brucine is a poison which has the physiological qualities of Strychnine, but in a markedly less degree. Authorities differ, some considering it one-sixteenth, others from one-fortieth to one-fiftieth less energetic than Strychnine as a convulsant. It is absorbed much slower, and although more energetic as concerns the sensory nerves, is decidedly less dangerous than Strychnine.

The antidotes and treatment for poisoning by Brucine are the same as for Strychnine.

PHARMACEUTICAL PREPARATIONS.

The alkaloids are sometimes prescribed in solution, and have long been made into pill, tablet or pellet form. Of the solutions, Hall's Solution of Strychnine is an old preparation occasionally used at present, especially by physicians inexperienced in the qualities of modern pharmacy as applied to the drug as a whole.† The sugared preparations carrying Strychnine and Brucine in tablet, pill and pellet form are simply mechanically divided alkaloidal doses, there being little if any distinction other than in name and no choice as concerns results. A tablet of one sixteenth grain Strychnine is the same as a pellet or a pill of the same strength. Either form is easily and cheaply stamped out, and neither requires any greater amount of skill than do other similar mechanical forms of medication, and neither presents any real advantage over the other. The action of the amount of alkaloid guaranteed in such medicaments is rationally assured from any of them, and in instances where

*Space does not permit us to go into the chemical reactions of these alkaloids. Besides, we do not favor inducing persons not professional chemists to engage in such responsibilities.

† In early days, owing to the uncertainty of galenical methods, physicians often resorted to solutions of less representative substances. In addition, in the infancy of Eclecticism, the experimental craze concerning "alkaloids" and "resinoids" led many in the same direction.

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Strychnine can serve the purpose, such preparations are useful and active.

It has been clinically determined that small amounts of Strychnine, combined with quinine, iron and phosphoric acid, present decided tonic qualities not present in either when exhibited alone. In other words, they fortify each other. This fact should not be lost to mind when the tonic quality of either substance is desired, especially when either fails separately to accomplish the desired effect. This is somewhat in accord with the fact that the natural drug combination which yields Strychnine presents advantages over that alkaloid, but the combination case under consideration introduces a new combination involving outside substances. Modifications of the formula named are known as Easton's Syrup, Aitkin's Syrup, and the Eclectic "Compound Tonic Mixture," which last is very popular, and will be the subject of a special Drug Treatise. But for the fact that iron compounds blacken natural Nux Vomica solutions, the natural drug would unquestionably in all these preparations be far superior to Strychnine.

Combinations of Strychnine and Belladonna; Strychnine, Aloes and Belladonna; and similar mixtures, in pill and tablet form, are used as laxatives, but should be employed under the discriminating care of a physician. This applies also to all forms and to all salts of Strychnine, whether simple or compounded, tablet, pill or pellet. All are energetic and cumulative poisons.*

Brucine is largely neglected in therapy. No pharmaceutical preparation or compound of it (other than the natural Nux Vomica) is commended in the Pharmacopœia or related works. Just why this is the case is perhaps not easily explained. Owing to its less violent action, supposition is that it might be preferable in many cases to the more energetic Strychnine.

Tincture of Nux Vomica.—This preparation was among the first, if not the first official preparation of Nux. It is made to-day by dissolving 20 grams of dried extract of Nux Vomica in enough of a mixture of alcohol 3 volumes, water 1 volume, to make 1000 cubic centimeters. This is perhaps the best known drug-store preparation of Nux Vomica, and needs no special comment.

*Recently an observing authority in medicine stated that in his opinion the actual poisonous effects of Strychnine were to be seen in many directions where physicians thoughtlessly gave small doses of Strychnine until its cumulative lethal effect followed. One such case came directly under the observation of the writer. Especially is it to be deprecated that the laity have learned to use these ready-made tablets and compounded pills of Strychnine as a constant self-treatment as a laxative. When persons without discriminative care or professional knowledge turn to the bottle of "Strychnine, Belladonna and Aloin," or similar pellets, as if they were innocuous substances, it is as a child playing with fire over a barrel of gunpowder.

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Extract of Nux Vomica.—This is a dried extract, and is brought to a pulverulent condition by the addition of milk sugar. It has a light color, is very bitter, and by the assay process of the U. S. P. yields 15 per cent. mixed alkaloids. It is mainly used in pill form, and to make the Tincture.

Fluid Extract of Nux Vomica.—This is more concentrated than the Tincture, and is made direct from the drug. 100 cubic centimeters yields 1.5 grammes mixed alkaloids by the U. S. P. assay method. It is an excellent but imperfect pharmaceutical preparation, its process being too tedious to permit of profitable manipulation on a small scale. Owing to the fact that the element of time plays such an important part in the exhaustion of the drug, and the process demands such an amount of alcohol, there is great expense and loss in manipulating a small amount. This applies also to the solid extract. Fluid Extract of Nux Vomica is intensely bitter, but less elegant in appearance than the Tincture.

These official pharmaceutical preparations are all poisonous in overdoses, and should be used with the same precautions as directed for Strychnine.

Specific Medicine Nux Vomica.—This preparation has long been the favorite of Eclectic physicians, and is commended by the medical authorities contributing the therapy of this special study. It is one of the most beautiful and most perfect of pharmaceutical preparations, rivalling Specific Medicine Gelsemium, Specific Medicine Collinsonia, etc., both in appearance, elegance and effectiveness. It is not standardized to a Strychnine or Brucine constituent, being in itself a standard that yields these bodies which, however, are but fragments broken out of the preparation as a whole. Specific Medicine Nux Vomica has a rich golden color, is limpid, of a pleasant, rather fragrant odor, and when shaken does not color the container. It mixes freely with alcohol, water, syrup, glycerin, or mixtures in any proportion of these substances. The resultant dilution is clear, and is scarcely colored, unless the Specific Medicine Nux Vomica be in excessive proportion. It represents the Nux accurately, being uniform in quality and exactness, and is a standard in itself, being so recognized. It can be kept indefinitely without precipitation or alteration in any way, other than in the slight concentration which might occur in bottles insecurely stoppered. The standard of quality is that which experience has shown should be maintained in the natural drug structural relationships, regardless of any one alkaloid that may be broken out of the preparation. If one drop of Specific Nux Vomica be added to 7000 drops of dis-

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tilled water, the bitterness of the drug is apparent in the dilution. One drop in 2000 drops is distinctly bitter, while one drop in 500 drops is most decided. Since, however, it is very easy to make a bitter compound by the addition of minute amounts of Strychnine or Brucine, or some foreign body, if bitterness alone is sought, this quality may be paralleled by a sophisticant without any Nux whatever. We give it simply as a taste standard which applies to genuine Specific Medicine Nux Vomica, which is made of Nux Vomica only. In this preparation bitterness is not as decided as in solutions of much less Strychnine than the Specific Medicine will yield.*

Caution.—In prescribing Specific Medicine Nux Vomica, care should be taken to avoid alkaline combinations, or soluble bromides and iodides. If these are present, the mixture must be well shaken before each dose is taken, because they decompose the Specific Medicine, precipitating Strychnine and Brucine. (See p. 4.) A favorite prescription of Dr. John Fearn and others is a combination of Asepsin and Specific Medicine Nux Vomica. (See Drug Study, No. VI, Asepsin, p. 6.) Asepsin is alkaline, hence the mixture must be well shaken before the dose is taken. In Specific Nux Vomica we have an example of the high degree, both of excellence and elegance, of an Eclectic preparation that can result from the special study of a drug originally introduced by the Regular school, many of whose members as yet have no general conception of the elegance and qualities of this admirable preparation.

Specific Medicine Nux Vomica is poisonous in overdoses, and should be prescribed with circumspection. In cases of a poisonous overdose, the treatment given under Strychnine (p. 5) should be at once instituted.

The suggestions of Dr. Howes (p. 10) concerning the interrupted treatment in order both to obtain its fullest remedial value, and to avoid its lethal cumulative action, is important.

THERAPEUTICS OF NUX VOMICA.

BY PITTS EDWIN HOWES, M. D., Boston, Mass.

Without doubt, Nux Vomica is one of the most valuable remedial agents which the physician has at his command for the relieving of diseased conditions.

*In this connection it may be said that natural compounds often present decidedly less disagreeable qualities than the products of chemical dissociation. The entire strength of a first-class cinchona bark can be made into a pleasant preparation, whereas a much less amount of quinine than it will yield, makes an unbearably disagreeable solution. The same rule applies to natural Nux Vomica, as shown in the Specific Medicine, which, although bitter, is yet pleasantly bitter to most persons.

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Were I restricted to five remedies for the alleviation of human ills, Specific Medicine Nux Vomica would hold a prominent place among the five.*

It would be an easy matter to fill up all the allotted space at my command with extracts from different writers testifying to the value of this drug, but such is not my intention. I desire in this paper to relate my own experience with the drug during the last twenty-three years.

However, a few preliminary statements are very essential, to my mind, to a correct understanding of what we have a right to expect from this drug:

First.—We must ever bear in mind that Nux Vomica represents the entire natural remedial constituents of the plant from which it is derived. We can not break it into its component parts, use them separately, and get from one constituent all the results we do from the original Specific Medicine.

All students of chemistry are familiar with the fact that the slightest change in the arrangement, or number, of atoms entering into a chemical combination is sufficient to produce a new compound. This new compound is entirely different in its uses and action. H_2SO_4 is the formula of sulphuric acid. Drop a single atom of oxygen and you have a very different substance, sulphurous acid. The same rule holds good with plant preparations. Break a natural compound into fragments by chemical means, such as fermentation, putrefaction, acids, alkalis, or other means, and new substances result. To destroy the complex compound in Nux Vomica by means of chemicals produces new substances, of which Strychnine is one, Brucine is another, Igasuric Acid a third, Loganin a fourth. The reputation of Nux Vomica in Eclectic medicine is established on the use of the entire structure embodying all these products, as shown by the Specific Medicine. The part that the ultimates represent in the natural structure, has not yet been determined. To transfer these established records of the whole to a fragment is fraudulent, because the fragment is not the whole.

With such facts as these constantly before them, I can not understand how some physicians can imagine that they obtain from the so-called active principle, which is a part only, the same results that they do from the representative of the entire plant.

Second.—We must remember that Nux Vomica is a remedy which can not be given indefinitely without detriment to our patients. Many

*Specific Nux Vomica stands fifth in a list compiled from several thousand reports of Eclectic physicians regarding the Eclectic Specific Medicines.—L.

NUX VOMICA.

times the substitution of some other medicinal agent for a short period, and then a return to the "Nux," is all that lies between failure and success in many chronic cases.

Third.—The size of the dose is important. I am a firm believer in the small dose of the remedy which we employ.

This is emphatically true of Nux Vomica when you are using a reliable preparation like the "Specific Medicine."

Commence with your minute dose, *not infinitesimal*, and you will be surprised to see the results which you will obtain.

Fourth.—The action of Nux Vomica upon the human economy should not be forgotten. My experience teaches me that it exerts its force principally upon the muscular tissues that are not under the control of the cerebrum, and which are connected with the digestive, urinary or reproductive apparatus.

Fifth.—It can be combined with many other indicated drugs, and the combination will prove more beneficial than either of them if used separately.

With these statements properly comprehended, we are in a position to study profitably the therapeutical action of Nux Vomica upon the different parts of the body.

Diseases of the Stomach.—In stomachic difficulties Nux Vomica holds a prominent place. This is especially true where there is considerable fullness in the abdomen, with pain that is constant in the region of the umbilicus. The condition is doubtless one of atony. The muscular tissues of the stomach have become flabby, and are not equal to the demand which is made upon them by the digestive process. Specific Nux Vomica, gtts. ii to v, in aqua $\bar{3}$ iv, given in $\bar{3}$ j doses half hour, or hour, in acute cases, and the same dose every four hours in chronic cases, will prove curative. Sometimes the remedy needs to be assisted by some other indicated agent. Those which I have found the most commonly indicated are sodium sulphite and Specific Medicine dioscorea and lobelia; when these are helpful, their special indications are present.

Headache.—The "Nux" headache is the result of a disordered stomach—generally due to the condition described above. The pain is always located immediately above the eyebrows, extending across the frontal region, and is usually accompanied with more or less dizziness. The same amount of Specific Medicine Nux, as before advised, may be used, but the dilution should be more frequently given, $\bar{3}$ j doses every fifteen minutes until relief is obtained. Frequently the addition of either gelsemium or belladonna, according as the patient is excited, or dull and heavy, will materially aid the action of your "Nux."

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Vomiting.—Nux in a minute quantity—one drop in four ounces of water—given in 3 j doses every ten minutes, will speedily control vomiting, unless the condition is due to an irritating substance within the stomach. Even the vomiting of pregnancy will often yield to the “Nux” when all other agents fail.

Intestinal Diseases.—Many of the intestinal wrongs yield to the influence of Nux Vomica, especially in those atonic individuals whose general condition seems to be below par. The digestive function of the small intestine seems at fault. Its function is not properly carried on, the semi-digested food forming a gas, which distends the bowel and is the cause of much distress. Here Specific Medicine Nux Vomica combined with dioscorea or colocynth will work a marvelous change.

Colic.—Infantile colic is speedily cured by means of Nux Vomica. Often has this drug made friends for me in the prompt relief produced in infantile colic. Here I use an extremely small dose. I pour into the teaspoon several drops of the Specific Nux Vomica, which I then pour back into the bottle, leaving only what will naturally adhere to the teaspoon. This I stir in a glass two-thirds full of water, and, if the patient is under a year old, direct that a half-teaspoonful be given to the child every half hour till relieved. If older than that, the dose should be one teaspoonful. This dose may seem small to many readers, but all I can say is, procure the Specific Nux Vomica, try it, and note the result.

As a tonic to the general digestive system after any form of acute illness, I have found the Nux Vomica an admirable agent. When using it for this purpose, I usually add gtts. v to gtts. x to 3 iv of albuminate of iron, and give teaspoonful doses of the dilution four times a day—before meals and at bed-time.

There is no one remedy with which I am acquainted that will so quickly restore the stomach to its normal state and keep it in such condition as Nux Vomica. Hence there are few diseased conditions where it can not be administered with advantage, for disease almost always interferes with digestion.

Urinary Disturbances.—If these are due to an atonic condition, the addition of Nux will decidedly aid any other medication that may be required. The Nux will tone up and strengthen the weak, flabby, muscular tissue, and exert a strong curative influence.

Diseases of Women.—Many of the diseases of women are the result of a weak, exhausted and over-taxed body. In such conditions, Nux proves very efficacious. It will also prove beneficial to the obstetrician when the pains are weak and atony is present.

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Heart Stimulant.—While Nux Vomica is not the quick heart stimulant that the intensely poisonous strychnine is, yet I am positive that it exerts a more decided, lasting, and more beneficial effect upon the muscular fibres of a heart, weakened by atony, than can possibly be produced by Strychnine.

All remedial effects which are permanent must be produced gradually. Diseased conditions are almost invariably the result of a gradual retrogression from the normal condition, or perfect health. Hence in our attempt to aid nature in her efforts to restore the normal equilibrium, we can best use those agents which will act, not strongly and quickly—they have their place in certain conditions and are then indispensable—but those which will gently and without too much disturbance bring about the desired result. Among such drugs there are none which are superior to Specific Medicine Nux Vomica, only it must not be overlooked that it will not do to continue the remedy too long, without alternating for a week or two with some other indicated agent. Nux Vomica is a cumulative remedy, and Strychnine is especially dangerous if long continued.

In general terms I would say that the dose of Specific Medicine Nux Vomica is from one to ten drops in a four ounce mixture, drachm (teaspoonful) doses being given every fifteen minutes to four times a day, according to the conditions for which it is administered. Acute conditions need the remedy frequently repeated, while those of a chronic nature should receive the drug at longer intervals.

Selections from Journal articles on the subject of Nux Vomica:

Nux Vomica.—In the first place, Strychnine can not take the place of Nux in fluid form. I do not know why, but I do know that it does not exert the same influence on the system. So I say, give the Specific Medicine, and use Strychnine only in hypodermic medication when the Specific Medicine is not admissible. Nux Vomica will probably meet as many pathological conditions as any medicine we use and will seldom disappoint us. A large number of ill-defined diseases affecting the digestive apparatus respond very quickly to Nux. The stomach is made the receptacle for almost every abomination, and the one thing which it resents is to be crowded, and so after a time it gets balky, and refuses to do much else than complain. It feels heavy and inactive; the breakfast has a tendency to wait for dinner to accompany it on its way. Sour belching tells of improper digestion. Dull, heavy headache is complained of, and the bowels seem to have concluded to join in a general strike. The skin is of a bad color. If we pinch it the wrinkle slowly disappears. Everything lacks tone and energy. These patients (and there are many of them) need Nux Vomica in small doses. They also need to be told to eat less and to drink a cup of *hot* water before going to bed at night. This treatment will tide you over many a difficult place where physic would get you deeper into the mire.

In cholera infantum, unless there is active irritation, Nux in very small doses will stop the vomiting, tone up the intestinal tract, and stop the exhausting dis-

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charges. I usually associate with it one of the soda salts—either the phosphate or the sulphate, preferably the phosphate.

Nux is indicated in cardiac debility and functional irregularity. In these cases it may be associated with pulsatilla or cactus.

In dyspnœa Nux acts on the respiratory centre, and breathing becomes quiet. In those cases where the patient awakes from sleep gasping for air, and feeling smothered and that his breathing has stopped, as he describes it, Nux will relieve the difficulty. In these cases a larger dose is desirable—twenty to thirty drops of the Specific Medicine Nux to four ounces of water, a teaspoonful of the dilution as needed, say from fifteen minutes at first, to every two or three hours after relief has come.

In nervous diseases it is of great value, but it is in those cases of lowered vital action. Care must be used not to administer it where there is exalted action of nervous force, for the effect of the medicine is to increase this function.

In labor Nux is an excellent remedy to excite and regulate labor pains by toning up the uterine muscle. After confinement it sometimes happens that the woman is unable to empty the bladder. Give her Nux.

Children, often, can not retain their urine. If this arises from weakness of the sphincter, give Nux and it will hold it shut. Its effect upon involuntary muscular tissue is always to strengthen it toward the normal, if given in sufficiently small doses, but the dose must be small. I remember once a patient excited, alien and on edge. He had violent priapism, and yet he needed Nux. Every indication proved it. He showed me a copy of the prescription he was then taking. A four-ounce mixture contained three drachms of Nux Vomica.* I gave him five drops in a half-glass of water, teaspoonful every hour, and he did nicely. The doctor was on the right road, but he traveled too fast.

The action of this medicine is truly wonderful, and will bear constant and repeated study. Whatever nature has stored up in it goes to supply vital action. I have no doubt its entire action is through the nervous system. This is one of my favorite medicines. And I again repeat: do not use Strychnine and expect to obtain the results which you can get from the Specific Medicine, which represents the full drug. In extracting the alkaloid, something is lost. What it is I do not know. I only know the effects.

Indications for Nux.—Lack of tone, irregular and subnormal function of involuntary muscular tissue, which indicate an exhausted nerve force.—*A. F. Stephens, M. D., American Medical Journal.*

Nux Vomica and Echinacea in Prolapsus Ani.—The mother stated that the child had been suffering from prolapsus ani, and that the bowels had been protruding for two or three weeks. We exposed the little patient on a table, and a mass of bluish-black intestine three inches long was found between the nates. It is a wonder that the bowel had not sloughed off before this. I reduced the prolapsed bowel gradually with the fingers, holding them as a cone and lubricating them well. The bowel was then carefully returned. When in place I first soaked a sponge in a strong solution of specific echinacea, ʒi, aqua fontana, ʒi, inserting the sponge to hold it in position, as the medicine would have a tendency to make the bowel contract. Then I prescribed

R. Specific Medicine Nux, - - - - - gtt. v.
 Aqua Fontana, - - - - - ʒ ii.
 M. Sig. -Teaspoonful every two hours.

*It is needless to say this was not Specific Medicine Nux Vomica, but probably the ordinary tincture of the shops.

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I had excellent success attending its use. Gave such articles of diet as would not have a tendency to constipate the bowels, chiefly boiled rice and oatmeal as food for a few days. A cure was effected.—*C. W. Pagel, M.D., American Medical Journal.*

Nux Vomica.—I often think of the wide range of usefulness of Nux Vomica. It is, perhaps, not more useful than some other remedies, but I should not like to try to practice medicine without this valuable remedy.

I always use the Specific Medicine Nux Vomica, as its strength is uniform and it can always be depended upon. I prefer the small dose frequently repeated in most cases. A favorite method of using the remedy is to medicate No. 30 or 40 Homœopathic pellets. They are so handy in this way that I can give them to a business man to carry in his vest pocket to take one or two occasionally for indigestion or headache caused by the sluggish action of the liver, stomach or bowels. Railroad men, farmers, etc., can carry them and use them in hot weather when they are inclined to drink so much water that it hurts them. Children can take a few pellets to school in cases of bowel trouble when they are not sick enough to stay out of school, and it is yet necessary for them to take medicine. Nux Vomica may be used to advantage in almost any atonic condition of the stomach and bowels. One of the plainest symptoms is a false condition of the mucous membrane. Other symptoms are nausea, when not caused by a loaded stomach, pain in the umbilical region, colic when the patient feels like hanging himself across a board fence. A weak heart will respond quickly to small frequent doses of Nux. Local paralysis or numbness, when the patient can not put the tongue straight out, but it will go to one side, Nux is surely one of the remedies; others may be indicated. When children are troubled with intestinal worms, follow your santoline with Nux. It is a valuable addition to Howe's Acid Solution of Iron as a general tonic.

R. Acid Solution of Iron, - - - - - 3 ii.
 Specific Medicine Nux Vomica, - - - - - gtt. vi.
 Simple Syrup, - - - - - q. s. 3 vi.

M. Sig.—One teaspoonful four times a day.

This will do splendid work in cases of weakness where the mucous membrane is pale and the appetite poor.

In chronic constipation Nux Vomica is the remedy; taken frequently during the day it encourages the peristaltic action of the bowels.—*A. S. Brecount, M. D., Annual, Eclectic Medicine and Surgery.*

Nux Vomica.—As specific ipecac was the remedy for irritation of the gastro-intestinal canal, Nux is the remedy for atony. The indications are: a sallow skin, fullness of the stomach and bowels, inaction or tendency to costiveness, pain in bowels, pallid or coated tongue. It will arrest vomiting and nausea frequently but not when the evidences of irritation are present. It arrests diarrhœa, chronic diarrhœa when it is due to an atonic condition, and there seems to be a want of power. In dyspepsia or chronic gastritis, in combination with muriatic acid, it excels any or all preparations of pepsin. In colic, when due to indigestion, the pain being in the umbilical region, either alone, or in alternation with specific colocynth, it will effect a cure. We generally prescribe it, drops five to twenty in water four ounces, teaspoonful of the mixture, according to the age of the patient and the effect desired, every one to four hours.—*W. N. Mundy, M. D., Eclectic Medical Journal.*

NUX VOMICA.

SPECIFIC INDICATIONS AND USES.

Specific Medicine Nux Vomica is the remedy for nausea and vomiting if the tongue shows atony; for colic if the tongue is broad and pallid; for atony of the liver and associate organs; for habitual constipation; to improve the innervation from the spinal cord; and in every case where there is abdominal pain pointing at the umbilicus. A yellow sallowness of skin and about the mouth, is an indication in chronic diseases.

In typhoid and asthenic disease, where there is impairment of spinal innervation, and in consequence imperfect or enfeebled respiration, we give Strychnine or Nux Vomica with advantage. Indeed in those cases in which the respiratory functions can only be carried on under the influence of the will, it is the only remedy we can rely on.

These agents are very valuable in the treatment of the alcohol habit, and as stimulants in threatened cardiac collapse.

SPECIAL NOTICE.

This series of Drug Studies has become so popular as to have necessitated the issuing of editions twice the size of the initial prints. Second editions of the first numbers have been printed in order to satisfy a multitude of physicians who neglected to preserve the initial numbers and who wish the series complete, as well as to supply many who, learning of the series, placed their names on the list too late to obtain the first issue.

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A TREATISE

ON

GELSEMIUM.

The Therapeutic Uses are written for this Treatise by Professor FINLEY ELLINGWOOD, M. D., Professor Materia Medica, Bennett Medical College, Chicago; Author of "A Systematic Treatise on Materia Medica and Therapeutics;" Editor Chicago Medical Times, etc.

The Reproductions are by

E. R. WATERHOUSE, M. D., W. N. MUNDY, M. D.,
B. L. SIMMONS, M. D., A. J. SMITH, M. D.

The Specific Indications and Uses are from Specific Medication by Professor J. M. SCUDDER, M. D.

The Illustration is drawn by Mr. W. F. HAMMER.

The Description, History, Chemistry and Pharmaceutical Record are by JOHN URI LLOYD.

Treatise No. I embraces Thuja Occidentalis.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. III embraces Pilocarpus (Jaborandi).

Treatise No. IV embraces Veratrum Viride.

Treatise No. V embraces Chionanthus Virginica.

Treatise No. VI embraces Asepsin and Asepsin Soap.

Treatise No. VII embraces Collinsonia Canadensis.

Treatise No. VIII embraces Nux Vomica.

Treatise No. IX embraces Gelsemium.

Treatise No. X will embrace Belladonna.

Drug Treatise, Number IX.

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GELSEMIUM.

Common Names.—Yellow Jessamine, Jessamine, Carolina Jessamine, Wild Woodbine, White Poison Vine, White Jessamine.

History.—*Gelsemium sempervirens* is a native of the Southern United States, being abundant in the swamps, woods and thickets, from Virginia to Florida. It is a handsome climber, twenty to fifty feet in length, blooming in early spring, its flowers being overpoweringly fragrant. The name, given by Jussieu, was made from the Italian word *Gelsomino*, meaning jasmine. But it is not a jessamine, and inasmuch as there is a true jessamine with *yellow* flowers, E. M. Holmes, of London, considers it unfortunate that the term *yellow jessamine* has been applied to it. This common name, however, is now firmly established. Its Italian name, *Gelsomino*, possibly led Eclectic authors to use the name *Gelseminum* instead of *Gelsemium*, a term found in early Eclectic literature and but recently displaced, a term perhaps, so far as derivation is concerned, more appropriate than the name commonly employed. In this connection it may be said that Professor Scudder invariably used the word *Gelseminum*.^{*1}

Medical History.—Barton and his co-laborers did not mention *Gelsemium*, but Rafinesque (1830) gave it a place, stating that "Root and flowers^{*2} are narcotic, their effluvia may cause stupor, tincture of the root is used for rheumatism in frictions," a statement taken almost literally from Elliott's *Botany of South Carolina and Georgia*, 1821.^{*3} The medical record (King) had its origin through

^{*1}—In an English botanical work in the Lloyd Library, which I can not now locate, a long discussion appeared concerning the two words. If memory serves me correctly, the decision was in favor of *Gelseminum*.

^{*2}—The statement has been made and possibly established that honey from the flowers of this plant is narcotic.

^{*3}—Stephen Elliott was born in Beaufort, S. C., November 11, 1771, and died in Charleston, March 28, 1830. He was studiously inclined, graduating from Yale in 1791. Returning to his Southern home he thereafter continued his studies, which inclined toward science, especially botany, his researches in that direction being specialized in the flora of South Carolina and Georgia, through which States he traveled and lectured on the subject. He became editor of the *Southern Review*, and took a conspicuous part in founding the *Literary and Philosophical Society*, and the *Medical Society of South Carolina*, being elected President of the first named body. He was elected a Fellow of the *American Academy of Science*, received the degree of LL. D. from Yale 1819, from Harvard 1822, and from Columbia in 1825. Between 1825 and 1830 he was Professor of Natural History and Botany in the Charleston Medical College. In civil affairs he was no less interested than in science, being a member of the lower house of the *South Carolina Legislature*, 1793-1812, and was elected President of the *State Bank*, organized in 1812, which position he held during the remainder of his life. His natural history collection was very large. In 1821 he published the first volume of his "*Botany of South Carolina and Georgia*," and in 1824 the second volume appeared. This work is often referred to by Porcher, and has been freely culled by subsequent authors, serving as a foundation for the medical uses of many Southern drugs. Too often little or no credit was given the author. Witness the remarks of Rafinesque concerning *Gelsemium*, which serves as a text for this biographical note, and which has served a chain of writers whose references scarcely alter the words of Elliott.

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the mistake of a servant of a Southern planter who was afflicted with fever. This servant by error gave his master a decoction of Gelsemium root, instead of the garden plant intended. Immediate loss of muscular power and great depression followed, all control of the limbs was lost, the eyelids drooped and could not be voluntarily opened. Death seemed imminent. But the effects finally wore away and the man recovered, free from fever, which did not recur. An observing physician took this experience as a text and prepared from Gelsemium a remedy which he called the "Electrical Febrifuge," which attained some popularity. Finally, the name of the drug concerned was given to the profession. This statement is found in the first edition of King's American Eclectic Dispensatory, 1852, which work actually presented Gelsemium to the world of medicine, although, as will be shown later, the plant had a recorded position much earlier. King's article on Gelsemium was copied in substance by the United States Dispensatory, 1854, none of the preceding nine editions of that work having mentioned the drug. But the fact is that Porcher* commended Gelsemium in his report to the American Medical Association, 1849, and, concerning its restricted local use in gonorrhœa and rheumatism, referred to Frost's Elements of Materia Medica (South Carolina) as well as to several local journal articles.

For a long time following 1852 (at which date King's American Dispensatory appeared), Gelsemium remained an almost exclusive remedy of the Eclectic school, but in 1860 it attained a position in the U. S. Pharmacopœia, although not until 1880 did that work give place to any preparation of Gelsemium. At present the drug is in much favor with many physicians of the Regular school, and should in justice to themselves be used by most of them, but it is generally classed as one of the Eclectic remedies, being actually one of the most important in Eclectic therapy.†

* Francis Cyre Porcher was born December 14, 1824, St. John's, Berkeley Co., S. C., being the descendant of a French Huguenot family. In 1847 he graduated from the South Carolina State Medical College, Charleston, where he afterward became a professor of Clinical Medicine and Materia Medica. For many years he was editor of the Charleston Medical Journal and Review, was corresponding member of the Academy of Natural Sciences, and Fellow of the College of Physicians, Philadelphia. He was President of the S. C. Medical Association, and during the Civil War was Surgeon in Charge of the Confederate Hospitals, Norfolk and Petersburg, Va. In 1849 he contributed a "Report on the Indigenous Medicinal Plants of South Carolina," Am. Med. Assoc., 176 pp., and in 1854 wrote for the Am. Med. Assoc. a paper on "The Medicinal and Toxicological Properties of the Cryptogamic Plants of the U. S.," 126 pp. In 1863 he wrote his (now rare) monumental production in behalf of the Confederacy, "Resources of the Southern Fields and Forests," by direction of the Surgeon General of the C. S. A. Dr. Porcher died in Charleston, S. C., November 19, 1896.

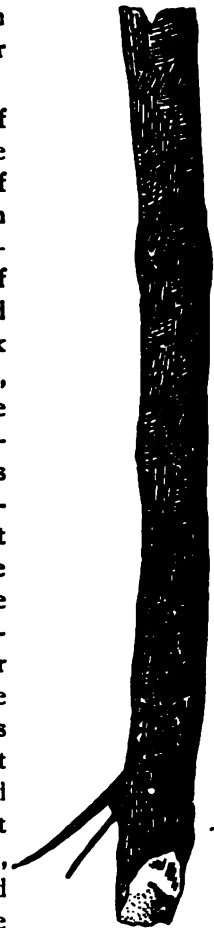
† In this connection it may be stated that Gelsemium has been often presented in Regular print by such journal contributors as Drs. John Scott, Isaac Ott, E. A. Anderson, G. S. Courtright, W. C. Hull, and many others. Professor Roberts Bartholow gave it great attention in his *Materia Medica*, and also in journal contributions in both Europe and America. Professor T. J. Wormley gave its alkaloid chemical consideration, while Drs. Ringer and Murrell in the *London Lancet*, 1875-76-78, made admirable researches. The American interest in Gelsemium, outside the Eclectic school, notwithstanding the clinical evidence of the authorities we have mentioned, and others who might be named, is in fact founded on the work of Bartholow, Wormley, Ringer and Murrell.

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Notwithstanding its energetic effects, questions have arisen concerning the lethal powers of Gelsemium, and because in one instance a lad of twenty years swallowed six fluid drachms of the tincture without serious results, the argument has been advanced that Gelsemium is not a poison. But probably the tincture taken was at fault; we have seen specimens that need not have been feared if swallowed in any amount, short of alcoholic effect. The fact is, many authentic cases of death from Gelsemium are on record, although none have come under our immediate observation.

Description.—The rhizome and root of Gelsemium are very tough, woody and brittle when dry. The rhizome attains the length of many feet and may be one to two inches in diameter, the knot at the stem base even reaching the size of a man's fist and weighing half a pound. The rhizome is brown externally and nearly white within. When chewed the bark imparts a bitter taste, not otherwise disagreeable, but as the virtues reside almost wholly in the bark, the wood is nearly tasteless. The rhizome-bark is thin, clings close to the wood, and carries numerous tough, silky, bast fibers, which, however, in our experience, are not as abundant as some authors have described. When green, the bruised rhizome exhales a peculiar, honey-like odor, to the writer very pleasing and characteristic. This disappears on drying the drug. For thirty years or more, Eclectic physicians have insisted that the green drug possesses qualities altogether absent in the dry. This we accept without reserve, and for decades have worked only the green drug, believing that the point as concerns its superiority is not debatable, and that, too, notwithstanding that the described alkaloids and other products broken out of the drug are fixed, and the official pharmacopœial preparations are made from the dry root.

Constituents.—In 1855 Mr. Henry Kollock identified an alkaloid which he named *gelsemina*, a resin, and a volatile oil. In 1869 both Prof. Maisch and C. L. Eberle again obtained the alkaloid, stating, however, that it was absent from the wood of the root, a



DRIED FRAGMENT OF
GELSEMIUM RHIZOME
(Natural Size.)

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point Gerrard afterward supported. In 1870 Prof. Wormley identified Gelsemic Acid in a fluid extract, which substance Chas. A. Robbins, 1876, pronounced identical with *Æsculin*. Prof. Fluckiger, soon afterward, from specimens of pure Gelsemic Acid made for him by the writer, denied their identity,*¹ and this view was supported by Wormley (1882) and Coblenz**² (1897). Since (1898) Prof. E. Schmidt gave the formula $C_{10}H_8O_4$ to Gelsemic Acid, which is the same as the formula of beta-methyl-*æsculetin*.

The qualities and constitution of the alkaloid, or rather we should say of the *alkaloids*, for the subject of their number is yet one of discussion, are yet under dispute. Sonnenschein and Robbins (1876) gave $C_{11}H_{19}NO_3$, while Gerrard (1893) gave $C_{12}H_{14}NO_3$, with which Spiegel (1893) agreed. Thompson (1887) identified *two* alkaloids, one of which he called *gelsemine*, the other *gelseminine*, and this (1893) was supported by Cushny. Prof. L. E. Sayre showed (1897) that the vine contained neither alkaloid nor acid, identifying 0.2% of alkaloid in the rhizome and 0.37% Gelsemic Acid. The root contained less alkaloid (0.17%). The difference, however, in proportion of alkaloid is only one of bark relationship. Since all the alkaloid is found in the bark, which in the rhizome bears a less proportion to the wood than in the small roots, the root yields more alkaloid than the rhizome.

Gelsemine (either or both the alkaloids) is colorless, odorless, very bitter, slightly soluble in water, soluble in dilute acids, chloroform and ether. It produces the poisonous effects of Gelsemium. This should not be confused with the so-called concentration Gelsemin (see p. 7).

Gelsemic Acid is in brilliant, colorless crystals, nearly insoluble in water, soluble in hot alcohol, from which it mostly crystallizes on cooling. It exists either free in the drug, or combined so loosely (perhaps both free and combined), as to be easily liberated from solution without the use of chemicals. Gelsemic Acid is tasteless, but traces even produce an intense blue fluorescence in alkaline water. It is the substance that gives the blue color to liquids of Gelsemium, but when isolated it has no value whatever in therapy, so far as any of the known Gelsemium qualities are concerned. If a fluorescent aqueous solution of Gelsemic Acid be exposed to the sunlight, it quickly (Miss Margaret Stewart) loses its blueness, and the fluorescence is not restored by ammonia.

*1—Private correspondence. So far as I know Professor Fluckiger did not publish his results.

**2—The Gelsemic Acid used by Coblenz was also made by me, and was identical with that used by Fluckiger. It was pure white, and crystalline.

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All this problematic chemistry of Gelsemium products is however a matter of indifference to the physician desiring a balanced representative preparation of Gelsemium, partly because the questionable basic products on record, as well as the resin and extractives, are obtained from the dry root and not from the green. None of them carry the qualities of the preparations of Gelsemium that have made the therapeutical reputation of the drug. If the drying process did not break the natural interstructural combination, the heroic chemistry used in splitting it into fragments would accomplish that result. These alkaloids and other products are obtained from Gelsemium, but we neither comprehend how they have been created, nor what their natural relationships may be, nor yet the part they bear to the host that gives them birth, and which, as a whole, is so sensitive as to forbid even the process of drying, if one wishes the fullest and finest qualities of Gelsemium.

PHARMACEUTICAL PREPARATIONS.

Distillate.—The fact that bruised, green Gelsemium root exhales a pleasant odor, which disappears on drying, indicates that this substance should impart its qualities to water distilled from the crushed green rhizome. This, however, is not the case, the distillate being of a very different odor. The fact that certain of the qualities of the green root are not possessed by the dry, indicates also that an active, volatile substance should be obtained by distillation. However, the distillate is devoid of any Gelsemium quality. It is limpid, clear, possesses no volatile oil, differs in odor from green Gelsemium, and can be swallowed with impunity. Either the heat of distillation destroys the natural volatile compounds; or they are so evanescent as to vaporize by the touch of hot water, not to condense; or oxydation produces new substances which have the fragrance of the green drug, but are permanent as gases.* This distillate possesses none of the remedial characters of Gelsemium and is devoid of therapeutic interest.

Fluid Extract.—This is the usual shop preparation, and became official in 1880. It has a dark red color, and is made from dry Gelsemium. The presence of Gelsemic Acid gives it a blue fluorescence, and, if it be a representative preparation, the presence of the poisonous alkaloid gives it a decided lethal action. The Fluid Extract is not used to any great extent by Eclectic physicians, and is too familiar to others to require special attention.

*It does not necessarily follow that an odoriferous substance is a condensible gas. While it is true that such bodies as oil of gaultheria are volatile and susceptible to recovery by distillation and condensation, it is also true that other odoriferous substances, *e. g.* musk and certain penetrating perfumes, do not parallel such bodies.

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Gelsemin.—This substance is one of the intruded* members of the old Eclectic resins (resinoids) and concentrations. It was introduced from the outside and became attached to Eclecticism, but was discarded under protest, decades ago, by Eclectic physicians. It has since been used mainly by physicians who are not conversant with modern improved Eclectic pharmacy. Gelsemin is an extractive mixture of such products of the drug as can be retained in a dry form, and is composed mostly of inert material. It should carry the alkaloids of the drug, for they are fixed, and there is no reason why a dried extract should be devoid of them. Death has resulted from the error of giving the very poisonous *alkaloid* Gelsemine for the less active "*concentration*" Gelsemin, and the principle reason for our giving space to this paragraph is to call attention to the fact that the "*resinoid*" Gelsemin is not the alkaloid Gelsemine. Since Gelsemin is an inferior product, neither certain in construction nor commendable in quality as regards even dried Gelsemium, it would be better if physicians seeking a Gelsemium product would take the experience of physicians who, half a century ago, came near having their opportunities wrecked on the uncertainties of the resinoid, alkaloid, concentrations, of which Gelsemin is a member, and which, but for the influence of Professor John King and others, might have been disastrous to the Eclectic school. In this connection, be it said, at no time did Gelsemin ever gain recognition, even in name, in any edition of the American Dispensatory.

Specific Medicine Gelsemium.—This preparation is, in our opinion, the preferable form of Gelsemium. It has a golden, amber color, and when shaken does not stain the glass. It is possessed of a delicate fragrance, reminding one of honey. When dropped into water, alcohol, syrup, or glycerin, no precipitation occurs, the liquid remaining transparent. (See footnote page 8.)

The color imparted to water by small amounts of Specific Gelsemium is slight, excepting the blue fluorescence, which can be observed on the side next the light. In looking through an aqueous mixture towards the light, no blue color is seen.† A few drops of ammonia increases the yellow color of the liquid and also enhances the fluorescence.

The taste of the Specific Gelsemium is bitter, at the same time the flavor, due to the odor, becomes apparent. When a few drops

*By "intruded" we mean the "resinoids" that were not introduced by Eclectics. If the interested reader will take the pains to look up the Eclectic Dispensatory record, it will be seen that dried solid extracts were never sanctioned by Eclecticism. They were introduced from outside.

†The best way to catch this blue fluorescence is, while near a window, to look down into a dilution. The side of the container next the window will be vividly marked. The substance (Gelsemic Acid) that gives this reaction is not, however, in itself (see p. 5) of any material value in therapy.

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of Specific Gelsemium is mixed with water in a test tube, the usual reactions for alkaloids are to be obtained, although, as has been repeatedly stated, we consider the alkaloidal feature but one of the fortifying qualities of this preparation. In our opinion, the care exerted in selecting material, the study made of methods and processes, the advantages possessed in apparatus devoted to this class of preparations, makes of Specific Gelsemium a thing in itself, as contrasted with other Gelsemium products. Specific Medicine Gelsemium is a perfect pharmaceutical preparation, of exact and uniform quality, standing the effects of any climate, and retaining its energies indefinitely. It is the choicest, both pharmaceutically and energetically, of all Gelsemium preparations. It will be observed that medical authorities contributing the therapy of Gelsemium refer to the Specific Medicine as their standard.

THERAPEUTICS OF GELSEMIUM.

BY PROFESSOR FINLEY ELLINGWOOD, M. D., Chicago, Illinois.

The primary influence of Gelsemium—that which probably always underlies its remedial influence upon any condition—should be borne steadily in mind in its administration. Its direct action is upon the central nervous system. It diminishes the blood supply of the brain and spinal cord by lessening nerve power, inhibiting the nerve control, slowing, retarding or staying the functional action of the nerve centers over the nerves themselves, influencing them steadily in the line of their physiological activities. It thus subdues all forms of nerve excitation of whatever character, or wherever located. It inhibits excessive nerve action. Nerve irritation, whether direct or reflex, comes uniformly under its influence.

There must be, then, increased nerve tension, with its consequent irritation, and usually, local hyperæmia or increased and undue blood supply in sthenic conditions. It is not the remedy when asthenia prevails.

The specific symptoms which call for its administration directly are those of acute determination of blood to the brain—acute cerebral hyperæmia—manifested by a bright flush upon the face, bright eyes with contracted pupils, with a busy restlessness and excitability. With these there is a high degree of nerve tension and consequent irritation, with increased heat of the head and face. There is present in acute cases, elevated temperature, hot skin, usually dry, a sharp and quick pulse, but not always hard.

In the acute fevers of childhood the evidences of nerve irritation are seldom absent. Here the agent exercises its happiest influ-

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ence. Muscular twitchings with the above specific symptoms demand this remedy, and no agent is more immediately positive and reliable, or invariable in its action. If spasms supervene, the dose is increased in size and frequency until they are controlled. Often no other agent need be given.

In acute inflammation of whatever organ or part, there is likely to be a time during its early course when Gelsemium is the positively indicated remedy. Its administration should cease when its indications are no longer apparent.

In acute inflammations, especially those of childhood, or in persistent fevers, where reflex irritation threatens to induce convulsions, other fever remedies should usually be suspended for this until all irritation has abated, or until its beneficial action is no longer conspicuously apparent. If its physiological effects appear at any time during prolonged or protracted fever or inflammation, it should be suspended temporarily, or permanently, within the judgment of the prescriber, as its full physiological influence persisted in, may impair nerve tonicity, and general tonicity of the muscular system, or of the heart, to such a degree as to retard recovery, or at least to prolong convalescence.

The direct contra-indication is congestion, either of the nerve centers alone, or of any organ. The phenomena of dullness, hebetude, obstructed circulation, whether local or general, with normal or lowering temperature, with increasing weakness—asthenia—must be treated with the antitheses of Gelsemium.

Fevers of nearly all kinds in adults, in the early and sthenic stage, are influenced by Gelsemium, because the above conditions to some degree are a part of the pathology of increased temperature.

In acute cerebral, spinal, cerebro-spinal, or meningeal inflammations, its symptomatology is usually strongly marked at first, and the agent is of signal benefit. If in adults, it may be given at first in pronounced doses, lessened as the symptoms abate or as its physiological action appears. In later stages of these disorders the dosage should be much smaller, or some remedy more directly indicated should be substituted. It should never be continued beyond the sthenic stage.

There are some forms of nervous wakefulness in which no better soporific can be given than this agent. Begun early in the evening, a few full doses will produce tranquillity and restful repose. If there be busy excitability and extreme restlessness, its influence will be greatly enhanced by combination with hyoscyamus. Nervous headache, which drives away sleep, can often be removed and sleep satis-

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factorily induced with this remedy. The nervous system is in part restored during sleep so induced, and the patient is rested.

In nervous excitation of women consequent upon acute peritonitis, ovaritis, salpingitis, metritis, puerperal fever, or mastitis, this agent has no peer. It is especially commended in the early stages, and if hysterical phenomena develop. Given in the early stages in pronounced, but carefully watched, dosage it will occasionally abort the entire condition, especially if the cause has been removed by proper methods. Extreme full doses are sometimes admissible at first.

In puerperal convulsions this agent has a conspicuous place. If given in accord with its exact symptomatology, in sufficiently large, often heroic doses, no agent will act better, but it must be exactly so given. The symptomatology of veratrum is more often present than that of this agent.

In intestinal inflammation, it has not seemed to me to be often indicated for the actual fever, and yet the reflex nerve phenomena, especially of children, often quickly demand it. It controls nervous or spasmodic pain in these conditions, and I have found it of great service in appendicitis. It seems to retard the inflammatory processes. It is of great advantage in the tenesmus of dysentery, sometimes allaying this troublesome symptom in a single full dose. Usually several frequent, pronounced doses are demanded.

In inflammation within the chest I have not used the agent as often as bryonia and aconite. Others speak highly of it, and there are conditions when the demands for it are too plain to be ignored. Certain forms of asthma are relieved by it quite promptly. Others have had good results from its influence in whooping cough and in laryngismus stridulus. It controls certain forms of spasmodic cough and cough from reflex irritation.

In acute cold, the whole system is influenced by it, the coryza being marked and all the usual symptoms pronounced. Gelsemium given in two or three-drop doses, every half hour for a few doses, will often give relief most promptly and satisfactorily. In epidemic influenza it has been generally used with signal results in nearly all cases.

In acute nephritis it is certainly a sovereign remedy. It at first meets a wide range of the symptoms in a pronounced manner. It reduces the arterial tension, often at once, and consequently the quantity of albumin. It exercises a permanent, soothing influence upon nerves of the entire urinary apparatus in a most satisfactory manner. The quantity of urine is increased, the general nervous phenomena are delayed, the fever abates, and any pain or spasms

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are controlled. My practice has been to give macrotys with the Gelsemium in acute nephritis from cold, but I am positive the beneficial influence could not be obtained without Gelsemium.

In post diphtheritic or post scarlatinal nephritis it controls any undue irritation, but belladonna acts upon the actual condition more satisfactorily than Gelsemium. In post puerperal nephritis, I should certainly fail of a cure without this agent. In three very bad cases I gave Gelsemium in full large doses with the very best results. It anticipates the uremic symptoms, preserves tranquillity of the nervous system, and wards off the otherwise almost inevitable convulsions. It is of especial service in the spasmodic retention of urine of hysterical women, or in acute urinary irritation.

Spasmodic pain in the urinary organs have no more reliable antidote than Gelsemium. Spasmodic pain in the bladder, or in the cystic sphincter, are controlled quickly, and acute cystitis should be treated with Gelsemium from the first. The soothing influence of the agent upon the entire nerve distribution of these organs is soon evident. In spasmodic urethral stricture where pain is excruciating and nothing but a catheter will apparently do any good, Gelsemium is often all sufficient. I have had two marked cases where the catheter could not be passed, in one case, even under chloroform, where full repeated doses of Gelsemium relieved the irritation and retention within two hours. I give from two to five drops of the Specific Medicine every twenty or thirty minutes even if mild physiological symptoms appear. In the tenesmus of chronic catarrhal cystitis it is excellent.

In Gonorrhœa, in the first stages, it is a very prompt remedy, especially if used in conjunction with irrigation of the urethra. This remedy alone will often produce much relief in twenty-four hours. Where there is much excitement with chordee no remedy is more prompt.

Spasmodic types of ovarian neuralgia and neuralgic dysmenorrhœa are controlled with Gelsemium. It relieves uterine colic promptly. In confinement it dilates a rigid os uteri, especially when the parts are dry and hot, and the edges of the os are hard, thin and unyielding, where nervous excitability is present. It soothes the general nervous system at this time, overcomes erratic, sharp, cutting, nagging pains, that seem to be of no benefit, preserves the integrity of the nerve force, and if the pains are exaggerated, and the labor does not advance, the labor is sometimes satisfactorily suspended or retarded until all parts are ready for the expulsive effort.

It is a most soothing remedy after labor, relieving nervous excitability and preventing or controlling after pains, but I do not

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consider it a proper or safe remedy with which to control these pains, as I am confident that its influence upon the normal muscular contractility of the uterine fibre causes relaxation, permits uterine hemorrhage, and retards normal involution.

It is a valuable remedy for hysteria. It is combined with pulsatilla to advantage in young girls. In pregnant women with frequently recurring paroxysms, cimicifuga, in small doses, will facilitate its action, as will viburnum or aletris.

In diseases of the nervous system of a chronic character, the influence of Gelsemium is beneficial, but not so pronounced. In excitable mania it exercises a controlling influence, and if sleeplessness be present its influence is enhanced by combination with hyoscyamus. It has exercised a beneficial influence in epilepsy, especially in those cases where acute cerebral hyperæmia is pronounced.

It has prevented and controlled tetanus, especially in the initial stage. Dr. Lewis, of Momence, Ill., claims to have prevented the development of three cases by the use of echinacea for the toxemia, and Gelsemium and passiflora for the spasm. In the tetanus of horses it acts better than in man, and is now quite generally used, hypodermically, by veterinarians throughout America. They claim that it cures many cases. I lay claim to any honor that may be due to first suggesting to the veterinary profession its probable value for this purpose. This I did to my classes in the Chicago Veterinary College in 1884, when lecturing there upon chemistry. My suggestion received a general test at once, and the remedy a wide adoption.

This agent has its place in chorea, but only when its specific indications are present, not in those cases characterized by anemia.

In the treatment of facial neuralgia, especially of the fifth pair, its influence is pronounced. I am of the opinion that the influence of the agent upon the nerve centers is from the brain downward, and that a large dose given for its influence upon the lower spinal nerves will exercise a too pronounced effect upon the nerves of the head and face, and upon the respiration. It is, therefore, seldom given in sufficient doses to control sciatica. It should be used hypodermically over the sciatic nerves. It controls headaches from cerebral engorgement with nervous irritability and excitability.

It is a serviceable remedy for migraine and tic douloureux. In persistent stitch, like pains in the deep muscles of the back, which often completely incapacitate a man for work of any kind, full doses just short of its apparent physiological action will act in a most specific manner. I obtained this suggestion from Dr. Lyman Watkins, and it has been fully verified.

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In rheumatic stiffness of the muscles of the neck, often accompanied with sharp pain, this agent should be freely given. In acute rheumatism and in rheumatic fever it is often sharply indicated. Given in connection with aconite, bryonia or rhus tox., as these are indicated, no better treatment can be instituted.

I consider Gelsemium a most important heart remedy. The cases are those of rapid heart from over excitability, irritability, with exaltation of nerve force, excitability induced from general nervous excitability, but where the patient is in full strength. No other remedy need be given in some of these cases. It relieves palpitation so induced and cures cardiac neuralgia. It is especially useful in the irritable heart of hysteria, influencing the entire train of symptoms at once. It is contra-indicated in weak heart, and where there are valvular lesions of any considerable character.

In sea-sickness, Specific Medicine Gelsemium has been used with marked success. Dr. Perce commended it, and in one instance two ladies on a European voyage, who followed his directions, escaped, while nearly all the other voyagers suffered. A teaspoonful of a mixture of thirty drops Specific Medicine in four ounces of water was taken at the time of sailing, and repeated hourly the first day. Afterward it was taken less frequently. Neither party was sick. On the return journey, although the sea was very rough, the same course of indications was pursued with the same result. In this connection, be it said, in sea-sickness the remedy that cures one person may fail in another, and it is not to be hoped that Gelsemium will affect all alike.

I am inclined to the belief that in the South, its natural habitat, the conditions assumed by acute disease are more directly and specifically influenced by Gelsemium than in the colder climates. Perhaps those factors of disease in which Gelsemium is specifically indicated are more frequently induced or increased by the climatic influences of that locality. At least, our physicians in the South, who use the remedy to any extent, use it much more freely, and seem to find its indications present more often than we do in the North.

Dr. Smith, of Leesburg, Florida, told me that in the malarial disorders which prevail in his locality he found indications for its use in nearly all acute cases and almost invariably obtained prompt and satisfactory results. He has occasion to prescribe larger quantities of it than of all other fever and sedative remedies combined. Dr. Wm. M. Durham, of Atlanta, Georgia, and several other physicians of the South confirmed Dr. Smith's opinion as to the frequency of the occurrence of its indications. All these physicians unite in

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the opinion that Gelsemium quickly induces or brings about that condition in periodical malarial disorders in which the antiperiodic, quinine, can exercise its happiest influence. It restores secretion, softens and slows the pulse, reduces nerve excitation and irritation, causes a mild transpiration from the skin, and assists in cleaning the tongue. All these conditions must be present if quinine be given to marked advantage and with no unpleasant results. These physicians claim further, that given during the time of the administration of quinine, it prevents undue stimulation of a sensitive nervous system, does away entirely in most cases with the tinnitus aurium, and other unpleasant phenomena, and enhances the influence of the quinine in all lines of its action, the desired effect being obtainable by a less quantity of this antiperiodic than would otherwise be required. These suggestions are no doubt applicable in other localities to a degree.

I have heard physicians say that they believed there were times or seasons when Gelsemium influenced their patients with the same indications much more directly and positively than at other times. Perhaps this is in line with the theory of "epidemic remedial influence" or "epidemic remedial conditions" advanced by Rademacher and referred to by Scudder and other writers.

The necessity of a uniformly active form of Gelsemium, and the fact that in commerce preparations of the dried drug prevail, has led Eclectic physicians to use the Specific Medicine.

Gelsemium in Chorea.—I have often stated to my students that I regarded Gelsemium as being the most important remedy in the entire materia medica. I base my statement upon the fact that there is no other drug that will fulfill so many important conditions. We may get several distinct actions from the same drug, according to the size of the dose, and the condition of the patient. Many practitioners believe that they know all that is to be known regarding such a common remedy as this, but will be surprised at the many unrecorded uses that they will find for it, by giving it their close attention for a period of a year's time.

Within the last two years I have entirely cured several of the most aggravated cases of chorea that I have ever seen with Gelsemium, and the cure was accomplished in about thirty days in each instance. In September, 1888, Benny L., aged 12 years, was brought to the college for treatment. The history of the case was that the boy had been healthy up to his sixth year, when he was severely sick with diphtheria, chorea following the subsidence of the diphtheria, and for the following six years it remained about the same, in spite of continual treatment from "regular" physicians, a dozen or more of whom were employed. I prescribed $\frac{3}{4}$ ss Specific Medicine Gelsemium, to be taken in doses of gtt. ij four times a day. Within thirty days the boy was well.

CASE 2.—This case was a bright little fellow of 11 years. Had been a victim of chorea for over a year, was under treatment in this city for some time, when he was taken to Philadelphia and put under the treatment of a physician of world-wide reputation. Under his treatment the boy improved to some extent, and was

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brought back to this city, but within a week after returning was as bad as ever. He came into my hands on June 3, 1889, about a month after his return from the East. He was not able to stand alone, to articulate understandingly, or to feed himself. I gave him a vial of homœopathic globules No. 60, each globule having absorbed a single drop of Specific Medicine Gelsemium, by putting them in a shallow dish, and applying the Specific Medicine with an ordinary medicine dropper. Of this I directed that he take two of the pellets before each meal and one at bed-time. He was brought to my office four times, the last call being on July 5th, when I discharged him as being entirely well, he having taken about one drachm of Specific Medicine Gelsemium. I have seen him often since that time and there has not been the slightest symptom of the trouble manifest.—*Prof. E. R. Waterhouse, California Medical Journal.*

Uses of Gelsemium.—This is one of our sheet anchors, and has a very wide field of usefulness. Its indications are bright eyes, contracted pupils, flushed face, elevated temperature and fast pulse. You can thus see that it is frequently called for in acute inflammatory affections of all kinds, and we do thus use it, and many times combine it with the indicated special sedative. It is of use in spasmodic affections. In reflex spasms of childhood we would not exchange it for any other remedy we possess. It is also of great use in spasms of centric origin. In retention of urine from a spasmodic contraction of the neck of the bladder we know of no better remedy; but for this purpose it must be given in full-sized doses. In suppression of the menses from cold, combined with pulsatilla, it has no equal. The dosage has a wide range—from the fraction of a drop to half a drachm. It is seldom necessary to give the latter dose, though we have done so, in the retention of urine, as stated above, and in a few cases of puerperal eclampsia and meningitis. Gelsemium is the remedy in the early stages of meningitis; belladonna in the latter.—*W. N. Mundy, M. D., Eclectic Medical Journal.*

Uses of Gelsemium.—Dose, the fraction of a drop to twenty drops. To tell all the good things about Gelsemium would require a separate article. It is almost daily used by me. I cure coryza with a single dose given at night. Those "catches" in lumbar muscles, sometimes causing the patient to fall, are always benefited, and many times cured with Gelsemium. In the acute stage of gonorrhœa it is one of the best internal agents. In many lesions of the kidneys, bladder, and nervous system it is of paramount importance. Specific indications are flushed face, bright eyes, contracted pupils, and general excitation of the nervous system. Equally as good an indication is the pallid face with bounding carotids.—*Benj. L. Simmons, M. D., Eclectic Medical Gleaner.*

Uses of Gelsemium.—

R. Specific Medicine Gelsemium, - - - - gtt. xx.

Simple Syrup, - - - - $\frac{3}{4}$ iv.

M. Sig.—Teaspoonful every half hour to two hours.

Indications.—Great restlessness, flushed face, bright eyes, and contracted pupils. Add to this, elevated temperature, full quick and bounding pulse, and we will have the combined indication for both Gelsemium and Veratrum vir. When such symptoms prevail Gelsemium and Veratrum should be put up in the same solution, and they will fulfill all expectations. Gelsemium is seldom if ever indicated alone, and is not called for in connection with any other remedy than veratrum. It is the special remedy in determination of blood to the nerve centers, especially to the roots of the spinal motors.—*A. J. Smith, M. D., Eclectic Medical Journal.*

GELSEMIUM.

SPECIFIC INDICATIONS AND USES.

Gelsemium exerts a specific influence upon the brain, and to a less extent upon the spinal center and sympathetic. It relieves irritation and determination of blood, and the disordered innervation that flows from it. Probably there is no remedy in the *Materia Medica* that is more direct and certain in its action. Given, a case of irritation and determination of blood to the brain, marked by flushed face, bright eyes, contracted pupils, restlessness and irritability, we prescribe Gelsemium with certainty. This being a common complication in diseases of childhood, it is especially the child's remedy. Acting in this direction, it lessens the frequency of the heart's action, and removes obstruction to the free flow of blood—a sedative. It also increases secretion in the same way.

I do not think the Gelsemium exerts any important influence other than through this action upon the nervous system. But, as will be observed, this is a very important action.

It is contra-indicated where the circulation is feeble and there is tendency to congestion, especially if there is a feeble circulation in the nerve centers. We never give it if the eyes are dull, pupils dilated, and the countenance expressionless. In such cases, it may prove fatal in quite moderate doses. A number of these cases are on record, three or four, in which death was produced by as small a dose as gtts. xxx of a common tincture. It has one other specific action, which is worthy of mention. It is *the* remedy in dysuria from stricture, and will rarely fail in enabling the patient to pass urine in from four to eight hours.—*Scudder's Specific Medication*.

DOSE.

Indications.—Flushed face, bright eyes, contracted pupils, increased heat of head, and general headache.

Use.—In determination of blood and inflammation of the brain; in fever and inflammatory diseases with the above symptoms.

R. Gelsemium, - - - - - gtts. x to xx.

Water, - - - - - 3 iv.

M. Sig.—A teaspoonful of the dilution every hour.

Poisonous in overdoses.

PRICES OF SPECIFIC MEDICINE GELSEMIUM.

¼-lb. Package	65c. each.	By mail, 87c. each.
½-lb. “	\$1.25 “	Not mailable.
1-lb. “	2.50 “	Not mailable.

For sale by Pharmacists generally, and by all Wholesale Druggists of America.

MAY, 1904.

LLOYD BROTHERS, Cincinnati.

A TREATISE ON GELSEMIUM.

(Second Edition. Enlarged.)

The Therapeutic Uses are written for this Treatise by Professor Finley Ellingwood, M.D., Professor Materia Medica, Bennett Medical College, Chicago; Author of "A Systematic Treatise on Materia Medica and Therapeutics;" Editor Ellingwood's Therapeutist, etc.

The Reproductions are by

E. R. Waterhouse, M.D., W. N. Mundy, M.D.,
B. L. Simmons, M.D., A. J. Smith, M.D.

The Specific Indications and Uses are from Specific Medication by Professor J. M. Scudder, M.D.

The Comments on "Gelsemium Red" are by

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Drug Treatise, Number IX.

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GELSEMIUM RED.

Red, superior to all other Gelsemium preparations I have ever used.—*Isaiah Bennett, M.D., Wilsonville, Neb.*

Forty-three Years.—

I have used Gelsemium for forty-three years, and could not succeed without it. I always feel confident of results, if my diagnosis be correct. I have always depended upon Lloyd's Specific Medicine. It never disappoints, but brings results desired. I consider all of Lloyd's preparations the very best obtainable. My experience with the "RED" Gelsemium is limited, though, so far, I am deeply impressed with its therapeutic value, and much pleased with the distinctive red color.—*Stephen M. Bennett, M.D., New Goshen, Ind.*

Twenty-five Years.—I have employed Gelsemium for twenty-five years, and daily find it more and more useful. I consider it one of the most reliable of remedies, and I never visit patients without carrying Specific Medicine Gelsemium in the satchel. Gelsemium ranks among my first and most important of remedial agents. Your recent improvement on the Specific Medicine Gelsemium is another mark of the pharmaceutical excellence and skill of your laboratories.

I have used two bottles of the "red" and find it entirely satisfactory and reliable. I have tried it in acute gonorrhœa, neuralgia, acute catarrhal attacks, or acute catarrhal la grippe, nervous excitement attending infectious diseases, and consider no other remedy its equal in the initial stages of acute colds or catarrhal attacks, especially when the nasal mucous membranes are primarily the seat of attack.

Gelsemium is a safer and better remedy in many conditions for which opiates are frequently exhibited. When opium is given with gelsemium, less of the opium is necessary and a more kindly effect is produced.—*Wm. P. Best, M.D., Indianapolis, Ind.*

Twenty-six Years.—I have employed Gelsemium for twenty-six years, using it daily, and am never without it. I use no other Gelsemium preparations than those of Lloyd Brothers. The **Gelsemium, Red**, is more elegant than any form I have used heretofore.—*H. H. Blankmeyer, M.D., Aransas Pass, Tex.*

Sixteen Years.—I have used Gelsemium for sixteen years, and consider it the most important remedy in my practice. I find a greater variety of uses for Gelsemium than for any other of your preparations. So far as I can see, there is no difference in therapeutic effect between Specific Medicine Gelsemium, "red," and the regular Specific Medicine; but in appearance it is more elegant.—*Thomas Bowles, M.D., Harrison, Ohio.*

GELSEMIUM RED.

Twenty-one Years.—Have used Gelsemium for twenty-one years, using it daily when indicated, and carrying it in the medicine case. We rely upon the Specific Medicine.—*Drs. J. B. Brewer and J. C. Brewer, Jefferson, Wis.*

Twenty-nine Years.—I have used Gelsemium for twenty-nine years, and it occupies first place in my practice. When indicated, it has no compeer. It is absolutely specific in action when indicated and properly prescribed. The Specific Medicine Gelsemium, "red," is more palatable than the former preparations of this remedy, and in no way objectionable to the patient. I prefer it to the former Specific Medicine, and consider it superior, because of its pleasant taste.—*M. A. Carriker, M.D., Nebraska City, Neb.*

Twenty-seven Years.—

I have used Specific Medicine Gelsemium for twenty-seven years, and consider it my "sheet anchor" in all spasmodic cases and fevers. I use Gelsemium with marked success, in 15 to 20 drop doses, two hours apart, to abort a sudden cold, with chilly sensations, and also use it in painful spasms of the bladder in cystitis, as well as in cystitis with vesical spasm, frequent urination, etc. I use Gelsemium oftener than any other remedy.—*O. S. Coffin, M.D., Alexandria, Ind.*

Twenty-five Years.—

I have used Gelsemium for twenty-five years. It is indispensable to me in my practice. After trying the Gelsemium of other pharmacists, I find Lloyd's Gelsemium eminently superior to their preparations, judging by results. The results from the use of the Specific Medicine Gelsemium "RED" seem to me to be the same as those obtained from the old preparation.—*A. O. Conrad, M.D., Los Angeles, Cal.*

Twenty-seven Years.—

I have used Gelsemium for twenty-seven years. It is indispensable in my practice. I use it daily, and would be at sea without it. In spasmodic conditions I depend upon the Specific Medicine Gelsemium almost exclusively. It is my mainstay in puerperal eclampsia and renal and biliary colic, employed hypodermatically, usually combined with Specific Medicine Veratrum. I give a full hypodermic syringe at a dose, repeating every thirty minutes until there is complete relaxation in puerperal eclampsia.* In biliary colic, give fifteen to twenty drops at a dose, repeating every twenty to thirty minutes, until

*The form of Gelsemium commended for hypodermic use is the *Subculoyd Gelsemium*.—*L. B.*

GELSEMIUM RED.

easy. In febrile diseases, especially in children, "colds," vesical and renal irritation of every description, "Gelsemium Red" is my first remedy. Rationally and conservatively used, no other toxic remedy is so safe and free from objectionable results, and in my hands it often cheats "King Morphine" out of a ready victim. Specific Medicine Gelsemium "RED" is more pleasing, and more satisfactory than any other Gelsemium preparation.—*M. E. Daniel, M.D., Honey Grove, Tex.*

Sixteen Years.—

I have employed Gelsemium for sixteen years. It is one of the ten remedies most used in my practice. I find the new Gelsemium Red acts more quickly than other preparations, besides which it is clean, and presents a more pleasing appearance, which is another point in its favor.—*Frank P. Davis, M.D., Enid, Okla.*

Twenty-four Years.—I have used Gelsemium for twenty-four years. To practice medicine without Gelsemium would be willful malpractice for me. I never found fault with the old Specific Medicine Gelsemium; the red is very attractive.—*N. M. Dewees, M.D., Cambridge, O.*

Twenty-nine Years.—Gelsemium is one of my favorite remedies, and I use it frequently with excellent results. It is almost my main stay in obstetrical and other spasmodic troubles, especially in strangury.—*L. S. Downs, M.D., Galveston, Texas.*

Forty Years.—

I have employed Gelsemium for forty years, and could not do without it. I have found the new "RED" Gelsemium to be far superior, both in therapeutic excellence and in pharmaceutical elegance, to any other preparation of the drug I have ever used.—*W. M. Durham, M.D., Atlanta, Ga.*

Thirty-six Years.—I have employed Gelsemium for thirty-six years, and I use it more than any other one drug. Specific Medicine Gelsemium, "red," is a most elegant and reliable preparation of the drug. In therapeutic effect I see but little difference in it and the old Specific Medicine; if any difference, the red Gelsemium is stronger.—*G. T. Fuller, M.D., Mayfield, Ky.*

Thirty Years.—I have used Gelsemium for more than thirty years. It is one of my most frequently employed drugs. The Specific Medicine Gelsemium, "red," is an elegant preparation, and even superior in appearance to the regular Specific Gelsemium. Gelsemium

GELSEMIUM RED.

has not been as popular with me as it is said to have been with a certain prominent Eclectic of the past generation, who, every morning starting out to make his professional calls, always took with him a pint bottle of tincture of Gelsemium, and usually returned to his office with only the empty bottle. Still, during the past thirty years I have used many gallons of Specific Medicine Gelsemium, and always with gratifying results. My experience in the practice of Specific Medication has fully convinced me that Gelsemium is one of the most frequently needed Specific remedies. In my publication, *Specific Diagnosis and Medication*, my use of Gelsemium is fully given. I have employed Gelsemium for the prevention of sea-sickness with marked success. I direct the patient to take ten drops of the Specific Medicine in water before going on board the ship, and thereafter five drops in water every hour until it causes double vision. After that an occasional dose of five drops in water in case there is the slightest feeling of nausea.—*J. W. Fyfe, M.D., Saugatuck, Conn.*

Eight Years.—I have employed Gelsemium every day for eight years, and would not be without it for acute conditions that are often manifested. I always prefer Lloyd's preparations of vegetable remedies, and trust you will live a long time to improve and investigate the vegetable kingdom.—*Jno. H. Goss, M.D., Decatur, Ga.*

Sixteen Years.—

I have used Gelsemium for sixteen years, and have found it to be absolutely indispensable in my practice. The Specific Medicine Gelsemium "Red" is, therapeutically, a trifle more active. Pharmaceutically it is more elegant. I employ Gelsemium with much satisfaction in the eye pains of glaucoma, in neuralgia, in ear ache, and in acute catarrhal conditions.—*Dr. J. P. Harbert, Bellefontaine, Ohio.*

Twenty Years.—I have used Gelsemium for twenty years, and would be seriously handicapped without it. The **Specific Medicine Gelsemium, "red,"** is very near perfection in every way. I could wish no better.

In the past twenty years I have noted improvements in many of the Specific Medicines, and it is your perfect medicines that make me a confident prescriber. When I give a dose of Lloyd's medicines, I am sure of favorable results.—*Geo. W. Harvey, M.D., Bigpine, Cal.*

Eight Years.—

I have used Gelsemium for eight years, and would not now know, without a restudy of the materia medica, what to use if deprived of that remedy. The "RED" Gelsemium looks good, smells good, and

GELSEMIUM RED.

may be just as good as the old Specific Medicine. I have had no occasion to compare it with other preparations, for since I finished my course and began to practice, I have, when attainable, used only Specific Medicines according to the teaching of Specific Medication.—*W. B. Hartwig, M.D., Benwood, W. Va.*

Twenty-two Years.—

I have employed Gelsemium for twenty-two years. It is one of ten medicines that I use every day. I consider the Red Gelsemium an improvement upon the old Specific Medicine, and like it even better. In treating Tonsillitis this season, Specific Gelsemium "RED" has given me splendid results.—*J. Paul Harvill, M.D., Nashville, Tenn.*

Thirty-four Years.—I have used Gelsemium for thirty-four years. It is one of the most important drugs of my practice. I have always used the Specific Medicine exclusively, and am never without it. The "red" Gelsemium is surely the highest perfection that is possible.—*A. P. Hauss, M.D., New Albany, Ind.*

Seventeen Years.—I have used Gelsemium for seventeen years, and it is one of my six favorite drugs. During the past winter Gelsemium has been my "sheet anchor" in nasal sinus troubles and Grippe. "Red" Gelsemium is another triumph of the Lloyd Laboratory.—*Wm. L. Heeve, M.D., Brooklyn, N. Y.*

Twenty Years.—

I have employed Gelsemium for twenty years. It is a favorite remedy of mine and one of the most important I use. It will act in all hyperemic conditions, whether or not salient symptoms, such as bright eyes, etc., are present. I consider Specific Gelsemium "RED" an improvement, both in taste and action, over all other preparations of the drug.—*H. H. Helbing, M.D., St. Louis, Mo.*

Twenty-four Years.—

I have used Gelsemium for twenty-four years, and have always given it a place among the first ten remedies in my case. There is no more important or more certain remedy in its action than Specific Medicine Gelsemium. No one will be disappointed with the administration of this remedy, if he be careful to prescribe it according to specific indications. In Gelsemium RED you have given us an ideal pharmaceutical preparation.—*A. L. Henderson, M.D., Ft. Worth, Tex.*

Thirty-two Years.—I have used Gelsemium for thirty-two years and could not medically "keep house" without it. I do not believe

GELSEMIUM RED.

that any intelligent man can be well informed concerning the therapeutic qualities of Gelsemium and at the same time be a "drug nihilist." The two conditions are absolutely incompatible. **Gelsemium, "Red"**, is a dream of perfection. I sometimes think that it is even more active, therapeutically, than is the ordinary form. Pharmaceutically, it is perfection.—*H. L. Henderson, M.D., Astoria, Ore.*

[Other physicians (see report of Dr. Fuller) have spoken of the prompt action of Gelsemium, Red, as contrasted with other Gelsemium preparations. One physician, who has long depended on Gelsemium, has particularly described the quick gelsemium action, such as drooping eyelids and muscular relaxation, produced by the Gelsemium, Red, and has reduced his doses correspondingly.—*L.B.*]

Forty-six Years.—I have used Gelsemium since the date of my graduation, 1868. It is my most highly valued remedy. My use of the *Red Gelsemium* is yet limited.—*Geo. W. Holmes, M.D., Sharpes, Fla.*

Gelsemium in Typhoid Fever.

Twenty-six Years.—

R	Sp. Med. Aconite	gtt. x
	Sp. Med. Rhus tox.....	gtt. iij
	Sp. Med. Gelsemium	gtt. xx
	Water, q. s. ad.....	oz. iv.

M. Sig. A teaspoonful every hour.

"With this formula I could challenge the world in the treatment of typhoid fever."—*W. N. Holmes, M.D., Nashville, Tenn.*

Forty-three Years.—

I have used Gelsemium for forty-three years. It ranks first in my practice. It is well that Gelsemium is an American plant, for there is no substitute for Specific Medicine Gelsemium. The Specific Medicine Gelsemium "RED" is an elegant preparation, but, therapeutically, I have noticed no difference between it and the old remedy.—*G. W. Homsher, M.D., Camden, Ohio.*

Nineteen Years.—

I have used Gelsemium for more than nineteen years. It is one of the most important remedies in my practice, and I consider it one of the most important in the materia medica. I always use the Specific Medicine Gelsemium when indicated. It never fails to bring results. I wish to compliment your establishment on your Specific Medicine Gelsemium "RED." It meets all requirements. After nineteen or twenty years' experience with your medicines, I may say that the Specific Medicines made by you are a real necessity to the man who understands direct indications and can administer the direct remedy.—*Brose Horne, M.D., Gas City, Ind.*

GELSEMIUM RED.

Thirty-three Years.—I have used Gelsemium for thirty-three years. It is one of my principal remedies, and if prescribed according to indications, seldom disappoints. The **Specific Medicine Gelsemium, "Red,"** is an elegant preparation.—*B. Roswell Hubbard, M.D., Los Angeles, Cal.*

Twenty-seven Years.—

I have used Gelsemium for twenty-seven years, and could not practice medicine without it. The new preparation, **Specific Medicine Gelsemium "RED,"** is far superior to any other preparation of the drug I have ever seen.—*C. L. Johnstonbaugh, M.D., Bethlehem, Pa.*

Sixteen Years.—

I have used Gelsemium for sixteen years, and consider it indispensable. I find this remedy of the utmost importance in many conditions where the indications for it exist, especially so in obstetrics, pediatrics, and genito-urinary practice. The **Specific Medicine Gelsemium "RED"** is the best preparation of Gelsemium I have ever used. Other forms of Gelsemium I have found to be not uniform.—*Earl H. King, M.D., Saratoga Springs, New York.*

Twenty Years.—I have used Gelsemium for twenty years. It is very important in my practice, especially in acute disease and those of spasmodic character. I class it with Aconite, Bryonia, etc. I would not have the confidence in other preparations that I have in Lloyd's. They are as indispensable as my automobile, and I could not practice without them.—*E. J. Latta, M.D., Kenesaw, Neb.*

Seventeen Years.—

I have used Gelsemium for seventeen years. It is one of the most important remedies in my practice. **Specific Medicine Gelsemium "RED"** is fine, and I consider it as good or better than the old **Specific Medicine.**—*T. C. Leachman, M.D., Richmond, Okla.*

Twenty-six Years.—

I have used Gelsemium for twenty-six years. It is to me so important that I am never without it in my office or in my medicine or obstetrical case. Lloyd Brothers should be justly proud of the new "Red" Gelsemium. It is the finest preparation I have ever used. Appearance, taste, and odor are all improvements on the old preparation. I use it often in connection with Macrotys in menstrual trouble, and almost invariably use it with Aconite where there is fever in children. In incipient colds in the head Gelsemium is A No. 1. Macrotys, Bryonia, and Gelsemium is a favorite prescription of mine for La Grippe.—*J. D. McCann, M.D., Monticello, Ind.*

GELSEMIUM RED.

Forty-two Years.—I have used Gelsemium for forty-two years, and rank it one of my "first ten" remedies. I consider Gelsemium, Red, the best Gelsemium preparation I have ever used.—*J. H. McElhinney, M.D., Palm City, San Diego Co., Calif.*

Twenty-eight Years.—

I have employed Gelsemium for twenty-eight years. It is my favorite among all the medicines I use. I find the Specific Medicine Gelsemium Red much better than any other preparation of the drug I have used, being more kindly active, and giving more pleasing results than any other.—*O. P. McHenry, M.D., Hamilton, Ohio.*

Twenty Years.—I have employed Gelsemium for about twenty years, and consider it one of the most important remedies in my practice. In regard to the therapeutic excellence and pharmaceutical elegance, **Specific Medicine Gelsemium, "Red,"** holds the first place.—*Max Meyer, M.D., New York, N. Y.*

Twenty Years.—

I have employed Gelsemium for twenty years. It is very important in my practice, so much so that I could not do without it. In comparison with other preparations of Gelsemium that I have used, there is much to be said to the credit of Specific Medicine Gelsemium "RED."—*James C. Mitchell, M. D., Louisville, Ky.*

Twenty-five Years.—

I have used Gelsemium for about twenty-five years. It is a very valuable remedy. I do not think there is a day but what I prescribe it. Specific Medicine Gelsemium "Red" is far superior to any other preparation of its kind.—*W. K. Mock, M.D., Cleveland, Ohio.*

Thirty-two Years.—I have used Gelsemium every day since 1882 and do not know any other remedy that could take its place. So far as I have used the **Specific Medicine Gelsemium, "Red,"** I consider it equal to, if not superior, to any other preparation that I have employed.—*J. A. Monroe, M.D., Wheeling, W. Va.*

Forty Years.—I have employed Gelsemium for forty years. It is my most valuable remedy. If I had to practice medicine with only one remedy, I would choose Gelsemium.—*J. A. Munk, M.D., Los Angeles, California.*

Thirty-eight Years.—

I have used Gelsemium since I have known of Lloyd's preparation of that drug. I couldn't get along without it, and have never used it without obtaining favorable response. I consider the new "RED" Gelsemium superior to all other preparations of the drug I have used.

GELSEMIUM RED.

I used it on my wife, who had a high fever, and inside of twenty-four hours the fever had entirely disappeared.—*S. B. Munn, M.D., Waterbury, Conn.*

Thirty-one Years.—

I have employed Gelsemium since 1884. I would not feel that I had a complete medicine case unless it carried Lloyd's Specific Medicine Gelsemium. I know when Lloyd Bros. put their seal upon a preparation, it is as near perfection as can be reached. I consider all other preparations inferior, and the new "Red" Gelsemium is even superior to the old preparation. The indications for this remedy are: in headache where we have somewhat glassy eyes, contracted pupils, flushed face, convulsions, and rigid os uteri in child delivery. Gelsemium is also of use in cerebro-spinal meningitis, in spasmodic asthma, and in pleurisy.—*F. J. Neifer, M.D., South Bend, Ind.*

Twenty-seven Years.—

I use Gelsemium every day, and my twenty-seven years' use of it has made it to me practically indispensable. During these twenty-seven years I have never had occasion to employ any preparation of the drug other than the Specific Medicine, and found its use to be followed by excellent results in practically every instance. The general and specific indications for its administration, which are: "a vascular and nervous hypertension," and I believe it will relieve all relievable and curable conditions. I find Specific Gelsemium "RED" is an elegant preparation.—*J. S. Niederkorn, M.D., Versailles, Ohio.*

Thirty Years.—

I have used Gelsemium for thirty years, and probably not a day passes that it is not employed in some case in my practice. I want to add my vote for "Gelsemium, Red," because I consider it, pharmaceutically, a finer preparation than the old form, though therapeutically I can see no difference.—*E. B. Packer, M.D., Osage City, Kan.*

Thirty-four Years.—

I have used Gelsemium for about thirty-four years. It would be impossible for me to do without it, and in my practice nothing can replace it. I have found the Specific Medicine Gelsemium "RED" to be most excellent, being safe, sound and effective. All preparations of Lloyd's are the best, and very desirable.—*L. A. Perce, M.D., Long Beach, Cal.*

Twenty-two Years.—I have used Gelsemium for twenty-two years. It is one of my main stays when the indications are right. So far

GELSEMIUM RED.

as I have used the **Specific Medicine Gelsemium, "Red,"** I find it equal to any. In pharmaceutical elegance it exceeds all others. I had exhausted my stock of Gelsemium on a case of threatened lockjaw, when I received my first 4 oz. bottle of **Specific Medicine Gelsemium, "Red."** It finished the case with success.—*H. D. Peterson, M.D., Mül-
lersburg, Ky.*

Thirty-three Years.—

I have employed Gelsemium for thirty-three years. I consider it one of the most important of your Specific Medicines, and am never without it, and indeed, could not practice without it. I believe the Specific Medicine Gelsemium "RED" to be even superior to and more valuable than the old preparation, if that can be.—*Wm. Rauch, M.D., Johnstown, Pa.*

Forty-two Years.—

I have used Gelsemium for forty-two years, my attention being first called to it by my father, who was using it with marked success at that time, over forty-five years ago. It is and always has been so important to me that I would not willingly sacrifice Gelsemium for any other sedative that I know, nor could I do without it in other directions. It is my sheet anchor. The Eclectic physician knows a good remedial agent, and will never forget Gelsemium. When it is indicated it will always bring the right answer. I believe its color will forestall many accidents. I believe also that this new preparation will by its increased use bring out new uses of the drug.—*C. W. Rodecker, M.D., Holcombe, Wis.*

Twenty-seven Years.—I have used Gelsemium for twenty-seven years. It is of very first importance in my practice. No other preparation on the market, of which I have any knowledge, can even approach the "red" Gelsemium in pharmaceutical elegance. It is "*sui generis*."—*W. R. Ruble, M.D., Smith's Grove, Ky.*

Twenty Years.—I have been a user of your medicines for over twenty years, and have always found them satisfactory. Gelsemium, red, certainly is pharmaceutically superior to anything I have seen, although Specific Medicine Gelsemium has never failed to meet the indications for me.—*E. G. Sharp, M.D., Guthrie, Okla.*

Twelve Years.—

I have used Specific Medicine Gelsemium for almost twelve years. If the European war should cut off our supply of coal-tar pain relievers I could get along very well without them, but I don't see how I could practice without Gelsemium, as I use it for so many things.

GELSEMIUM RED.

The relief of pain, from that of headache to the pain of renal and hepatic colic, for which I use quite large doses, 5 drops every ten minutes until I have administered 20 to 30 drops, combined in severe cases with *moderate* doses of morphine. Specific Medicine Gelsemium "RED" is certainly the finest product of the drug ever offered to the profession.—*T. L. Sharp, M.D., Orlando, Okla.*

Forty Years.—

I have employed Specific Medicine Gelsemium for forty years, and use it more than any other remedy. The physician who becomes skilled in the use of Gelsemium is prepared to combat, in the most effective way, more pathological conditions than he could with any other remedy in the materia medica. I thoroughly believe in its efficacy. The Specific Medicine has always been my preference, and the new "Red" Gelsemium is in no way inferior to the former preparation, besides being made safer by the warning color.—*S. M. Sherman, M.D., Columbus, Ohio.*

Twenty-five Years.—

I have used Gelsemium for twenty-five years. I regard it as so important that without it in my medicine case, I would be at a loss in the majority of acute cases and in some chronic lesions. Gelsemium is indicated in many pathologic conditions. In acute states of determination of blood to the brain it is the leading remedy, and in many forms of neuralgia no remedy surpasses it. In malaria, acute or chronic, with cerebral, or cerebro-spinal excitation, Gelsemium is a prominent remedy. In fact, its therapeutic range is very elastic. The new Specific Medicine Gelsemium "RED" is amply equal to the occasion, and its use in place of other fluid forms is appealing and convincing, and since, in my twenty-five years of practice, I have not used more than two ounces of Gelsemium other than the Specific Medicine, I can confidently declare that the "Red" Gelsemium exceeds its brother in elegance and freedom from inert matter.—*B. L. Simmons, M.D., Granville, Tenn.*

Thirty Years.—

I have used Gelsemium for over thirty years, and consider it very important in my practice. I have always used the Specific Medicine until now. So far, I have not noticed much difference in therapeutic action between the new Specific Medicine Gelsemium, "Red," and the old preparation.—*J. R. Spencer, M.D., Cincinnati, Ohio.*

Thirty Years.—I have used Gelsemium for thirty years, and it is very important in my practice. The **Specific Medicine Gelsemium,**

GELSEMIUM RED.

"Red," compares well with the other preparations I have been using. Recently in a typical case of inflammation of the brain in a child three and a half years of age, with all the indications for Gelsemium, the Red gave prompt results.—*E. A. Squier, M.D., Frankfort, Ind.*

Thirty Years.—I have been using Gelsemium for the past thirty years, and it is one of my most important remedies. The new **"Red" Gelsemium** certainly carries all the medicinal properties of the plant and is a beautiful pharmaceutical preparation. I have prescribed Specific Medicine Gelsemium during my thirty years of practice, because I know none is better, if any be equal, to it. I have always felt that my patients were entitled to the best there is in the drug market, regardless of price, and believe that Specific Medicine Gelsemium holds that place.—*A. F. Stephens, M.D., St. Louis, Mo.*

Twenty-seven Years.—For twenty-seven years I have used Gelsemium. It is so important to me that I could hardly do without it, as I know of nothing that could take its place. I like the **"Red" Gelsemium** better than the former style as to color and appearance. Its effects are fully as positive, if not more so, while the taste is much pleasanter.—*Lee Strouse, M.D., Covington, Ky.*

Twenty-nine Years.—

I have used Gelsemium for twenty-nine years. It is the remedy of third importance in my practice, Aconite being first, and Asclepias tuberosa second. As Gelsemium has been a standard drug with the profession, the manufacturers as a rule have furnished very good preparations; the observable effects of the drugs are such that none but impostors would dare do otherwise. I have found the Specific Medicine Gelsemium **"RED"** to be an A No. 1 preparation of the drug.—*Geo. W. Thompson, M.D., New York, N. Y.*

Twenty-seven Years.—I have employed Gelsemium for twenty-seven years. I use it oftener than any other remedy, and know of no remedy that can take its place. I find the **Specific Medicine, Gelsemium, "Red,"** a very superior preparation.—*C. A. Tindall, M.D., Shelbyville, Ind.*

Eleven Years.—

I have used Gelsemium for eleven years. I have the utmost confidence in the action of this remedy, and find daily use for it in various diseases. The Specific Medicine Gelsemium is a wonder, and is as near a specific as a drug can be, when prescribed according to indications. Gelsemium **"RED"** is superior in every way to any other preparation of the drug.—*W. W. Tindall, M.D., Shelbyville, Ind.*

GELSEMIUM RED.

Three Years.—I have used Gelsemium for three years. It is one of the half dozen most important and widely-used drugs in my practice. I use no other preparations of Gelsemium than the Specific Medicine. I find the red Specific Medicine a more perfect pharmaceutical preparation, and in all respects equal to the older preparation. As Prof. Ellingwood says, "Nerve irritation, whether direct or reflex, comes uniformly under its influence;" but I differ with him where he says, "It is not the remedy when asthenia prevails." In perhaps the large majority of cases where I use Gelsemium the asthenic conditions prevail and the time-established specific indications are present. The drug certainly has its place in the asthenic case, where we want its mildly quieting influence upon the nervous system: the large dose in the sthenic case and the small dose in the asthenic case.

By way of illustration. Take a weak, feeble, asthenic case, where we have a wakeful condition due to nervousness, absolutely without the usual indications for Gelsemium. I know of no other drug that will give as pleasing a result in such a case as does the small dose of Gelsemium. The same indications in the sthenic case call for larger doses of the drug, with possibly the addition of Hyoscyamus.—*Paul R. Tindall, M.D., Greensburg, Ind.*

Twenty Years.—

I have employed Gelsemium for twenty years. It is to me so important that I could not dispense with it. Like all other Specific Medicines, Gelsemium is always reliable, which cannot, for obvious reasons, be said of many other preparations. The therapeutics of Specific Gelsemium could not be improved upon, and you have therefore, to paraphrase a well-known advertisement, "changed the appearance, because you could not change or improve the drug therapeutically." The "RED" Gelsemium is certainly an improvement in appearance upon the old, and physically and psychically is perfection as applied to the drug Gelsemium.—*J. E. G. Waddington, M.D., Detroit, Mich.*

Thirty Years.—I have used Gelsemium for about thirty years. It is to me the most important remedy in the whole *Materia Medica*. The Specific Medicine Gelsemium, "Red," is all that could be desired. A fine preparation and nearly a specific in that terrible disease, tetanus.—*E. R. Waterhouse, M.D., St. Louis, Mo.*

Forty-five Years.—

I have used Gelsemium for forty-five years. It is one of the remedies to which I resort every day. I have used various preparations of Gelsemium, for I could not always get what I wanted, but

GELSEMIUM RED.

the Specific Medicine Gelsemium "RED" is certainly the best form I have ever known, and surpasses them all.—*H. T. Webster, M.D., Oakland, Cal.*

Thirty-seven Years.—Gelsemium (or Gelseminum as then spelled) was included in the first order for drugs after my graduation in 1877, and has been kept in stock since that date. I know of nothing to take its place when indicated, and consider it about the sixth in importance in the list of Specific Medicines.

All doctors realize the value of the psychology of color when dispensing, for it is often accepted by patient, "as is the color, so is the power of the drug prescribed." Two drachms of Red Gelsemium to be taken in three-drop doses would be accepted as much more powerful than a water clear preparation. The red Gelsemium is therapeutically equal to, and much more elegant than any other preparation of this drug I have used.—*J. M. Wells, M.D., Vanceburg, Ky.*

Fifty Years.—I have used Gelsemium for fifty years, having begun its use in 1864. In 1866 I passed through an epidemic of typhoid fever in the Cedar River bottoms of Iowa, where the miasm of malaria was apparent at the outset of the disease. An old doctor suggested that the green-root tincture of Gelsemium with quinine would break up the fever, and that the toxic effect of these drugs would balance each other, so that quinine given in large doses in connection with Gelsemium would not produce head symptoms (buzzing), and that the drooped eyelid action of Gelsemium would be prevented by the quinine. This doctor gave ten grains of quinine with fifty drops of the green-root tincture of Gelsemium, repeating the dose in two hours, two doses only being given. No bad effects followed. I have used Gelsemium in many cases of tetanus, with fine effect and prompt recovery. My first case of this was in 1870, and since then I have had a number of cases which I have treated with Gelsemium hypodermically and also by mouth. In this disease large doses are necessary. I depend upon Gelsemium to keep down the spasms.

There is not a wrong statement in the Specific Medicine label of indications, while others could be added thereto. You have certainly achieved perfection in Specific Medicine Gelsemium, Red, and our school owes you immortal praise for your persistent labors.—*E. P. Whitford, M.D., Hollister, Mo.*

Fifty-four Years.—I have employed Gelsemium since March 1, 1860. No one remedy exceeds it in importance. A few years ago Mr. M., of Brookfield, N. Y., was badly afflicted with cramps in his limbs; all the doctors in the vicinity (three in the village) failed

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to give any relief, except by morphine. Some years before (until they moved from my vicinity) I had been the family doctor. I met his son accidentally at Unadilla Forks, Otsego. He stated his father's case and inquired if I thought I could do him any good. His father could walk only by the use of two canes. I filled a vial with Gelsemium, giving him written directions for its use. Inside of a week the father's cramps were a thing of the past. I have seen the man a number of times since, but there has been no return of the cramps, and no need of morphine. This is only one case in many hundreds where I have used Gelsemium.—*H. P. Whitford, M.D., Bridgewater, N. Y.*

Twenty-one Years.—

I have used Gelsemium for over twenty-one years. It is one of my first three remedies in acute diseases. I cannot see any difference in therapeutic effect between the old Specific Medicine and the new Specific Medicine Gelsemium "RED." The perfected "Gelsemium Red" is a most beautiful preparation.—*Fred'k O. Williams, M.D., Columbus, Ohio.*

Eleven Years.—

I have used Gelsemium ever since 1904. I have studied it very closely, and the better I know it the more frequently I see indications for its use. I use it more frequently than any other of our special sedatives, and possibly more often than all others together. I use it both by mouth and hypodermically, and though I have used it both ways in large doses, I have never seen any ill effects from its use. I like GELSEMIUM, RED, best of all the Gelsemium preparations.—*W. W. Wimer, M.D., Honey Grove, Texas.*

Fifty Years.—In puerperal eclampsia, with red face, use a hypodermic of Gelsemium.* In infantile convulsions leave Gelsemium to be administered in small doses and you can go away satisfied that the spasms will be controlled. The cause must, of course, be first removed.

In appearance, Specific Medicine Gelsemium, Red, is superb, and it will unquestionably be established as having the full therapeutic qualities of the root.—*E. Younkin, M. D., Villa Ridge, Mo.*

Thirty Years.—I have used Gelsemium for over thirty years. When specifically indicated, it is one of the most important drugs in my practice. I regard the new Red Gelsemium as a decided improvement upon the old preparation.—*J. M. Keys, M.D., Omaha, Neb.*

*Dr. Webb's book, *Hypodermic Medication*, is devoted wholly to plant remedies. It was written before Subculoyd Gelsemium was perfected, and does not commend Gelsemium hypodermically. Many physicians now use Subculoyd Gelsemium subcutaneously. This book can be obtained by enclosing \$1.00 to the author, Dr. Frank Webb, Bridgeport, Conn.

A TREATISE

ON

BELLADONNA.

The Therapeutic Uses are written for this Treatise by J. S. NIEDERKORN, M. D., Versailles, Ohio.

Illustrations Nos. 1, 2 and 4 are drawn for this Treatise by Mr. W. F. HAMMER. Illustration No. 3 is reproduced from the Microscopic Examination of Foods and Drugs, GREENISH.

The Description, History, Chemistry and Pharmaceutical Record are by JOHN URI LLOYD.

Treatise No. I	embraces Thuja Occidentalis.
Treatise No. II	embraces Cactus Grandiflorus.
Treatise No. III	embraces Pilocarpus (Jaborandi).
Treatise No. IV	embraces Veratrum Viride.
Treatise No. V	embraces Chionanthus Virginica.
Treatise No. VI	embraces Asepsin and Asepsin Soap.
Treatise No. VII	embraces Collinsonia Canadensis.
Treatise No. VIII	embraces Nux Vomica.
Treatise No. IX	embraces Gelsemium.
Treatise No. X	embraces Belladonna.
Treatise No. XI	will embrace Oenanthe Crocata, Vegetable Caustic, and Crataegus.

Drug Treatise, Number X.

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Belladonna.

[BEAUTIFUL LADY.]

Part Used.—The root, and the mature leaves of *Atropa Belladonna*, Linn. It is a native of Germany.

Common Names.—Deadly Nightshade, Dwale, Black Cherry, Strygium, Strychnon. According to Matthiolus of old, the Venetians called it "*Herba Belladonna*," because their ladies used a distilled water of the plant as a cosmetic; hence the name, "*Bella-donna*" (Beautiful Lady).

Medical History.—About 1504 a book appeared in Paris, titled, the "*Grand Herbar*," which carried the first authentic notice of this plant, although the term "*Solatrum minus*," used by Saladinus about 1450, is presumed to refer to it. From a very early day, *Belladonna* has been used in German domestic medicine.

Its effects, internally, were subjects of treatises by Amoreaux, Paris, 1760; Daries, Leipsic, 1776; Münch, Gottingen, 1783 and 1785; and subsequently by all who comprehensively wrote on medicine.

In Toxicology, the German botanist, Leonard Fuchs, figured it as *Solanum somniferum*, 1542, fully identifying its poisonous properties, and J. M. Faber, Augsburg, 1677, wrote on its poisonous action. But the people in the plant's habitat have always been aware that all parts, even to the berries, were poisonous.*

In the eye, so far as we can locate, the first study concerning its local effect is that of Himly of Paris, 1802, although country people in the habitat of *Belladonna*, from all time, knew that it possessed the power of dilating the pupil.

Although native to the Continent of Europe, *Belladonna* has been long used in England, having a place in the early Edinburgh and Dublin Dispensatories, as well as in the works of Withering; but Culpepper neglects it.

The earliest American works of the Regular School commend it, e. g. The *Pharmacopœia* of the Massachusetts Medical Society, 1808, Thacher's Dispensatory, 1821, while the Eclectic Dispensatory, Philadelphia, 1827, (†) commended the extract of the leaves. Homœopathic literature from the first has valued *Belladonna*, which

(*) The most complete treatise we know on *Belladonna* in a physiological direction is that of Dr. John Harley, co-editor of *St. Thomas' Hospital Reports*, 1874-76, London, 1889, in his work, titled, "*The Old Vegetable Neurotics*," of which the Lloyd Library is so fortunate as to possess a copy inscribed by the author. In it is also inscribed the autograph of "Monsieur Professor Ernest Charles Laseque," a well-known French physician and medical writer, born 1816, died 1885; co-editor of "*Archives Generales de Medicine*," 1855-83.

(†) This book was not a part of the literature now known as Eclectic in America. It was published anonymously, by "A Practising Physician," who belonged, evidently, to the Regular School. In this connection it may be stated that a journal was published in Philadelphia, 1836 to 1840, under the editorship of Dr. John Bell, titled, "*The Eclectic Journal of Medicine*." It was strictly Regular and had no interest in the American Eclectic School. It was continued as the "*Bulletin of Medical Science*."

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is a favorite Homœopathic remedy. In Eclecticism, Beach gave it prominence in all his works, while Dr. King, in the first edition of his American Eclectic Dispensatory, gives it much space. All Eclectic authors have highly commended it. The Thomsonians have never used it, and will not employ it. (*)

Description.—Green Belladonna root is from one to two inches thick, and a foot or more in length. The root is brown, rough, marked by transverse ridges, and by stout, divergent, branch roots. It has a radiate structure if sliced transversely; is possessed of an earthy smell, has little taste, but leaves a powerful, acrid after-taste. The bark is thick, juicy, and internally of a dull cream color. The dried root is rough, dirty-grey externally, whitish internally, appearing in commerce in irregular pieces. (See cut No. 1, showing good root; No. 2, inferior, sliced old root.) So far as medicinal value is concerned, the bark is the richest part of the root, hence (see cut No. 1 and also Drug Study No IX, page 5, Gelsemium), small roots are desirable, because in them the proportion of bark is greater.

Until now, all the Belladonna root of commerce has been the wild drug of Germany. Cultivation on a large scale by Johnson & Johnson have been exceedingly promising, especially as concerns its quality. If it becomes an American crop, culture will permit of its collection when in best condition.

The microscopic structure of Belladonna is peculiar, in that many of the cells of the middle layer, as well as central parts of the root, are loaded with small octahedral crystals of calcium oxalate. (Fig. 3, p. 4.)

No. 1—PRIME BELLADONNA ROOT, DRIED. No. 2—INFERIOR, SLICED OLD BELLADONNA ROOT.

(*) Thomson discarded all poisons, and his followers have adhered to his precept. Notwithstanding, the favorite Thomsonian remedy, Lobelia, is classed by some with poisons, and Thomson was the subject of great persecution because of his using it.

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The following data from "Red Cross Notes," Series V, No. 2, Johnson & Johnson, records the yield of total alkaloid, at different dates, in cultivated Belladonna:

Seeds planted in hot houses in February and March, 1904, transplanted to the open field in May.

June 24th. . . .	Plants, 6 inches high.	August 13th	Fruit Setting.
	Leaves, 0.453.		Leaves, 0.375.
	Roots, 0.568.		Roots, 0.27.
July 28th. . . .	Plants in full bloom.	September 26th	End of Season.
	Leaves, 0.5143.		Leaves, 0.800.
	Roots, 0.337.		Roots, 0.3275.
			Stems, 0.1734.

Constituents.—In our opinion, the term *derivatives* will better apply to the Belladonna ultimates, than *constituents*. Even the best

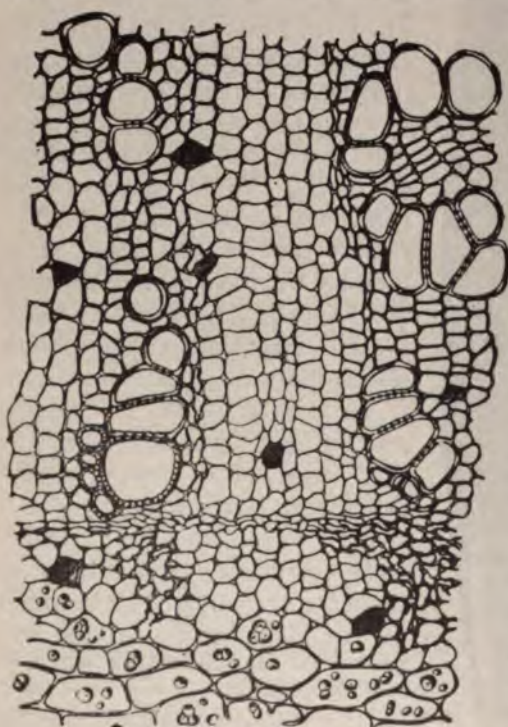


FIG. 3.—MICROSCOPIC SECTION OF BELLADONNA.
The black deposits are crystals of calcium oxalate.

known alkaloid derived from it (*atropine*) does not exist materially in prime Belladonna. But yet the drug tissue of all parts of Belladonna is strongly alkaloidal, and inasmuch as one of the final products of correlative chemistry is the characteristic alkaloid *atropine*, this strongly personal substance is usually taken as a standard for estimating the drug. Atropine was discovered in Belladonna root in 1819 by Brandes and was made in pure form, 1833 (Fluckiger), by a German apothecary named *Mein*, and was almost simultaneously discovered in the herb by Geiger and Hesse.

The root is exclusively employed by alkaloid manufacturers (see *Scopolia*, p. 5), but it varies greatly in alkaloidal yielding qualities. Considered from this point of view, Belladonna is one of the drugs needing most watchful care. Lefort (1872) showed that the maximum of atropine yielded by young roots was 0.6 per cent, whilst old, large roots gave not

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more than 0.25 to 0.31 per cent. In our experience it is not easy to find commercial Belladonna to assay as high as 0.5 per cent pure, total alkaloid.

Belladonna root and leaves yield other alkaloids and other constituents than atropine. These are subjects of much controversy, because experimenters, by reason of different methods of procedure, have either failed to find what others have discovered, or by their chemistry have created substances others did not produce. Some of these products may be named as follows:

Hyoscyamine ($C_{17}H_{23}NO_3$) is the principal alkaloid of Belladonna; by its transformation, chemists make atropine, which has the same formula. *Hyosine* ($C_{17}H_{23}NO_3$) was discovered by Ladenburg; *Chrys-atropic acid* by Kunz; *Atrosin* and *Belladonnine* by Hübschmann. Succinic acid, malates, oxalates, combined with sodium, potassium and magnesium, are conceded by all analysts. These, together with gum, wax, asparagin, and chlorophyl (in the leaves only), starch, and albuminous bodies that are peculiar not only to Belladonna, but to most

plants, constitutes the Belladonna products and educts, to which may be added certain artificial alkaloids produced from atropine, but more distant even than atropine, from natural Belladonna tissue.

Adulterations.—The usual admixtures or contaminations of roots resembling Belladonna are found in the commercial drug, sometimes intentionally, and again, through carelessness of collectors. If chicory is present, it is always by intent. The one great sophisticant is the root of *Scopolia* (*) (Japanese Belladonna), a Japanese plant which stands as the connecting link between *Hyoscyamus* and *Atropa*, differing mainly in that the fruit is not a berry, and the root is in the form of a rhizome. For these reasons there is no excuse for either collector or user employing this drug, as the distinguishing berry is absent, and the scar-marked *Scopolia* (see fig. 4) rhizome does not in the least resemble the parsnip-like root of Belladonna (see fig. 1 and 2). Notwithstanding these facts, immense quantities of *Scopolia* are sold and used for Belladonna. (†)

The sensible and chemical qualities of *Scopolia* are markedly similar to those of Belladonna. It yields atropine by the same pro-



FIG. 4.—SCOPOLIA,
the Sophisticant
of Belladonna.

(*) Johann Anton Scopoli was a learned botanist, physician and apothecary, born at Fleimsthal, Tyrol, 1723, where he acquired Latin at the gymnasium, beginning next the study of medicine at Innsbruck. Natural history, chemistry, botany and materia medica were not there taught, and physiology, pathology and therapeutics only in a meager way, which induced him to resort privately to the medical books published by Boerhave, Hoffman, Sydenham and

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cess that produces atropine from Belladonna, and yields it in larger amount. Its alkaloidal constituents are naturally the subject of much controversy, both in themselves and when contrasted with those of Belladonna, and in our opinion are likely to remain so, as long as different chemists, with different chemicals, are attacking a structure that, under various influences, yields varying products. For example, *Scopolamine*, which was first asserted to be the characteristic alkaloid of the drug, was considered by E. Schmidt to be identical with *Hyoscine*. O. Hesse next found it to consist of two alkaloids, *Hyoscine* and *Atroscine*, and next, Schmidt proved, to his own satisfaction, that *Hyoscine* was a mixture of *Scopolamine* and some other body, finally asserting that *Hyoscine* does not exist. The facts are, the broken-out fragments of these natural drug structures are interesting, and chiefly so, because of the opportunity they give investigators to puzzle themselves and others over artificially made products, whose qualities, changing under the influence of chemical reagents or atmospheric action, remind one of the chameleon. If a

others. Early in life he showed his love for botany by gathering herbs for an apothecary and studying their names and uses. He also accompanied herb collectors to Innsbruck-Alps, gathering and drying herbs. Then he visited the Botanical Garden of Venice, where he studied the herbarium. Next he went to Vienna and passed an examination by the medical faculty, in order to pursue his profession in Austria. During this journey he was shipwrecked, and most of his books and other valuables lost. In Idria he was compelled to administer medicine free to 2000 people. Here his wife and son died, and his shop was twice destroyed by fire. Finally the Government increased his salary 400 fl. annually, conditioned that he also lecture on mineralogy. He remained in Idria sixteen years. In 1760 his much appreciated *Flora Carniolica* appeared in Venice. *Hyoscyamus* Scopoli was placed under *Atropa* by Scopoli himself, but later was named after him. This plant was distinct enough to typify a genus, and as such includes the Japanese plant *Scopolia Japonica*, that furnishes the drug *Scopolia*. In 1761 appeared his work on Physics and Chemistry, Idrian quicksilver and vitriol, and the sickness of the mountain people of the quicksilver regions near Venice. This was afterward reissued, 1771, by Schlegel, and again, in translated form, by Herr Von Meidinger, 1786. From 1760 to 1772 appeared his five volume *Anni Historica Naturalis*, subsequently issued in German at Leipzig, wherein he describes his botanic journey to the Tyrolean Alps, making additions and corrections. After Jacquin went to Vienna, Scopoli was appointed in his stead by the Queen, removing to Hungary, where he lectured on metallurgy and mineralogy. Here he issued *Crystallographia Hungarica*, *Fundamenta Metallurgica*, and in 1772 a new edition of his *Flora Carniolica*, completely transformed to the Linnean system, and enlarged. In 1776 he received an appointment at Pavia, as Professor of Chemistry and Botany. Here he established both botanical gardens and chemical laboratories. His new discoveries were issued under the title "*Deliciae Florae et Faunae*." He also translated into Italian the valuable chemical dictionary of Macquer. He became blind in his right eye one year before his death, which occurred in his 65th year, 1788. This is the record of the scientist whose name is affixed to this Japanese sophisticant, *Scopolia Japonica*, the "*Belladonna of Japan*," a plant he had never seen.

(†) One of the most acrimonious discussions this writer has ever indulged, occurred with a dealer in crude drugs some years ago, because a consignment of Belladonna turned out to be *Scopolia*. The argument, that others accepted it for Belladonna did not serve to prevent our returning it as a sophisticant. Let us reproduce in this direction, the remarks of Prof. Frank Woodbury, M. D., concerning such sophistication:

"It is alleged, however, that some pharmacists are in the habit of dispensing, for genuine Belladonna plaster, a preparation which contains no extract of Belladonna, either leaves or root, but which is made with extract of *Stramonium*, or of *Duboisia*, or of *Hyoscyamus*, or of *Scopolia*, or some other member of the mydriatic alkaloid-bearing group of solanaceous plants. I think such a course is ethically and scientifically indefensible."—*Red Cross Notes*, No. 12, 1898.

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person desires the full qualities of *Scopolia*, he must use a preparation carrying the drug's structural constituents, unaffected by acid, alkali, or other destructive chemical reagent.

Belladonna is not *Scopolia*, and no man has the right to sell the one drug for the other. Especially has no man the right to label a pharmaceutical preparation of *Scopolia* with a *Belladonna* label. And now we will consider, briefly, the principal artificial product of both *Belladonna* and *Scopolia*.

Atropine.—This, the most stable product, is a very valuable remedy in its proper sphere, and, possibly, it matters little whether it is derived from *Belladonna* or *Scopolia*. It is a very strong organic base, intensely poisonous, white, odorless, crystalline, or amorphous. It dissolves in 150 parts of water, and in three parts of alcohol. It is seldom used in therapy, other than, occasionally, for making ointments and oleates. Atropine Sulphate, the salt most used, is a white, odorless, crystalline salt. It dissolves in less than half its weight of water, and in about six parts of alcohol. It is the atropine compound employed by oculists, and is limited almost exclusively to oculists, largely because of its intense violence when administered internally. This is the decision of thousands of qualified practicing physicians, as well as of exceptional expert authority, which is well voiced by Professor Frank Woodbury, M. D., as follows:

"Atropine has been before the medical profession in the role of the active principle of *Belladonna* for more than fifty years. Notwithstanding its obvious points of superiority for medical purposes, in facility for administration, both by the mouth and hypodermically, the smallness of the dose, its solubility, and uniformity of action, atropine has certainly not succeeded in winning the favor of physicians to the exclusion of the official preparations of *Belladonna*. Practicing physicians and clinical teachers continue to prescribe *Belladonna* preparations for a multitude of morbid conditions, in which experience has shown them it is of value, and have restricted the application of atropine almost entirely to its hypodermic use, and for a very limited number of conditions. Among these its epidermal application is never included. In our clinical amphitheaters, as in private practice, the prescription of *Belladonna* plasters is of daily occurrence, but the prescription specifically calling for the application of atropine to the unbroken skin, in the form of a plaster, has yet to be written."—Red Cross Notes, No. 12, 1898.

Attempts to replace natural *Belladonna* preparations by atropine have caused distressing results when the alkaloids were in amount sufficient to exert their violent influence. A small amount of an ointment containing only three grains of atropine produced death in two hours.

In this connection, we present the very latest, and let us add, exceptionally authentic information, from Mr. F. B. Kilmer, of Johnson & Johnson, than whom no man is better qualified to speak

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concerning the external use of Belladonna and the qualities of Belladonna plasters: (Personal letter with privilege of using facts given.)

"Observations made in our laboratory coupled with clinical observations made at our request, and reports from competent observers, have led us to emphatically believe that atropine does not represent the therapeutical value of Belladonna, especially when used in an external application, such as a plaster. All epidermal applications of atropine have given negative results and been abandoned, whereas, the external applications of Belladonna in the form of plasters and otherwise have a specific and an increasing use."—Feb. 21, 1905.

ATROPINE SULPHATE IN EYE DISEASES.

BY PROFESSOR KENT O. FOLTZ, M. D., Cincinnati, Ohio.

Indications.—In nearly all forms of iritis; in irritation of the iris, as shown by a slight pinkish pericorneal zone; traumatism of the iris, whether accidental or operative. In ulceration of the cornea, especially with a tendency to perforation, and the ulcer is central. In interstitial keratitis, and in ophthalmia neonatorum when the cornea is implicated.

Contraindications.—In sympathetic iritis and in iridocyclitis the drug is usually contraindicated. In glaucoma this is especially true. After the age of 40, care must be observed, as it may possibly induce glaucoma. In perforating ulcers of the cornea located near the periphery, the drug is usually contraindicated.

The employment of the alkaloid for internal administration is usually unsatisfactory, better results following the use of a reliable preparation of the crude drug Belladonna.

TOXICOLOGY AND TREATMENT OF BELLADONNA.

BY PROFESSOR HARVEY WICKES FELTER, M. D., Cincinnati, Ohio.

Except in degree and rapidity the toxic effects of Belladonna and its chief alkaloids are practically identical. Small doses occasion dryness and constriction of the throat, with possibly disordered vision and such unpleasant head symptoms as vertigo and confusion of ideas. Moderate doses provoke a greater degree of dryness of mouth and throat, on account of which there ensues marked difficulty in swallowing. The pulse is slowed, the pupils dilated, accommodation defective, and vision confused. The skin is dry and a considerable rise of temperature may take place. When, however, a dose large enough to produce vaso-motor paresis is taken, the temperature

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falls. Large and toxic doses greatly augment the dryness and dysphagia and giddiness, the patient reels or staggers when he walks, there is great thirst, and sometimes drowsiness and nausea and vomiting occur. The saliva now becomes suppressed, breathing is rapid, and dilation of the pupil extreme. Vision is either lost, or indistinct and double. The rate of the pulse may be doubled and the volume is full and hard. A marked scarlet efflorescence, resembling that of scarlatina, but lacking the punctations and subsequent desquamation of the latter, now overspreads the countenance and progresses upon the neck and body. The eyes are brilliant and staring, and the conjunctivæ may be congested. A peculiar active delirium accompanies and is of an illusional and loquacious character. The victim, though obvious of his surrounding, sees visions, entertains spectres, has fancies and hallucinations, and other phantasmagoria, and gives way to laughter and gayety; again the cerebral disturbance may be of a wild maniacal type, with furious delirium and fighting propensities. Loss of speech often occurs early, though repeated movements of the tongue and lips indicate the efforts to articulate. Purging, vomiting and unsuccessful attempts to micturate are frequent, though not constant, symptoms of Belladonna poisoning. Finally, with (rarely) or without convulsions, occurs a complete abolition of function, stupor sets in, the pulse becomes rapid and weak, the limbs cold, and paralysis closes the scene in death, which results chiefly from respiratory paralysis.

Should recovery take place, the patient seldom recollects any of the circumstances of his illness.

Extreme dryness of throat and mouth, scarlet efflorescence without puncta, widely dilated pupils, staring eyes, suppression of urine, and talkative or wild delirium should lead one to suspect Belladonna poisoning. In medication, the first three symptoms should be a warning to cease the administration of Belladonna or its alkaloids.

Dose and Fatal Period.—When atropine is the poisonous agent the effects are much quicker than with Belladonna, and abolition of muscular power may occur without either delirium or convulsions having occurred. A few Belladonna berries have caused death, as has an enema containing 1-6 grain of atropine. By mouth 1-12 grain of atropine and hypodermically 1-30 grain have likewise proved fatal. Again, recovery has followed the injection of much larger doses. Death has occurred in five minutes after the injection of atropine. It seldom takes place in less than two hours, and usually does not occur under fifteen to eighteen hours. Symptoms of poisoning are often delayed from one hour to six hours after taking the drug.

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Treatment of Belladonna poisoning should be prompt. Emetics, stomach pump, lavage tube, and tickling the throat to produce emesis should be resorted to at once. As Belladonna tends to wholly suppress the urine, catheterization should be resorted to early and frequent, to eliminate the poison and to prevent its reabsorption. As emetics, zinc sulphate, 20 grains, powdered ipecac, 10 grains, or mustard and salt (equal parts), 2 teaspoonfuls may be given in warm water, followed by copious draughts of luke warm water, to facilitate emesis. Unless contraindicated by marked depression, $\frac{1}{8}$ grain of apomorphine may be given. Purgatives, such as castor oil, are useful to free the intestinal tract of the poison. Sweet spirit of nitre facilitates its removal by way of the urinary organs.

As partial chemical antidotes, animal charcoal, tannic acid, and solution of iodine may serve a useful purpose.

While by no means a settled fact that morphine and Belladonna are in all respects antagonistic, it is still recognized that morphine judiciously employed is the best antidote to Belladonna and atropine poisoning. The best rule to follow is to be guided by the pupillary response. Therefore small and repeated doses administered until the pupils contract and are maintained in contraction is the best method to pursue. From the fact that jaborandi and its alkaloid pilocarpine, and calabar bean and its alkaloid physostigmine are in some measure antagonistic to Belladonna, they have been recommended and employed as physiological antidotes in poisoning by atropine and Belladonna.

PHARMACEUTICAL PREPARATIONS.

Fluid and Solid Extracts, U. S. P.—The solid extract is made from Belladonna leaves, the fluid extract from Belladonna root. These are the official, pharmacopœial preparations. When properly prepared they are very energetic, but are open to the general objection to extracts, in that the large amount of inert extractive materials present, is often a disturber of both quality and elegance. Still, inasmuch as no one constituent obtained from the drug parallels the natural combination in a safely therapeutic sense, physicians of the Regular School in medicine very wisely maintain these extracts as their remedial Belladonna standards. The solid extract, properly made, be it stated, stands unexcelled as a constituent for plasters, and as a component for Belladonna ointments.

Tincture of Belladonna, U. S. P., is made of Belladonna leaves. It has no advantage over the fluid extract, and seems to us to be one of the preparations the U. S. P. Revision Committee might well drop.

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Belladonna Plaster.—This is made (U. S. P.) by incorporating extract of Belladonna with an excipient made of a mixture of soap plaster and resin plaster. It is a great favorite with physicians and is a deservedly popular preparation. It should by assay produce 0.5 per cent mixed alkaloids of Belladonna root. In this connection the United States Dispensatory observes that "machine-spread Belladonna plaster can be found on the market, which was admitted by a representative of the manufacturer, to contain no Belladonna whatever." Whether such trade plasters are made of *Scopolia*, or the alkaloids, matters little, they are not true to name. The "rubber" machine plasters are very elegant and very satisfactory, and our experience with Mr. Kilmer during many years has convinced us that in his direction at least the most exacting pains are taken with the extract, which is unquestionably true to name.

Specific Medicine Belladonna.—This preparation is the recognized standard with Eclectic physicians. The process of preparation abstracts the characteristic structural drug constituents, without any application of chemistry or the use of chemicals, the aim being to correlate the qualities of the drug as a whole, and preserve them in an imperishable form. To this effect, continuous systematic investigations have been applied for several decades. The standard of strength is that of one grain of the best drug to one minim of the finished product. The concentration is accomplished by means of apparatus that attains the desired object, without disintegrating the natural drug constituents. (*)

Specific Medicine Belladonna has established itself as a standard of excellence, and has maintained this position for thirty years. It is not, however, commended nor employed because it contains atropine, for as Belladonna root does not appreciably contain atropine, the Specific Medicine Belladonna, carrying the unaltered constituents of the root, is practically free from the alkaloid. If, however, it be assayed by the usual methods adopted with Belladonna liquids it will, by reason of the chemistry applied, yield the Belladonna alkaloids liberally. Solutions of atropine and its salts are easily made (see atropine), they are physiologically very active poisons, and if the alkaloid only is wanted, preparations labeled Belladonna can be readily (*and very cheaply*) made to stand atropine tests, *without the use of any Belladonna drug whatever*.

Qualities.—Our experience teaches that to carry the full structural value of the Belladonna constituents into the Specific Medicine Belladonna necessitates the inclusion of the dark-colored semi-resin,

(*) This apparatus will be the subject of a treatise of this series, in which it will be illustrated and described in detail.

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between which and the structurally active compound exists a very intricate relationship. It is a part of the active tissue of Belladonna, and we accept that the markedly characteristic and yet lasting action of the Specific Medicine is largely due to the qualities that reside in the complex structure, in which this relative of resins takes an undetermined, but yet very important part. Consequently, Specific Medicine Belladonna is an exceptionally dark-colored member of the class of preparations (Specific Medicines) which are, as a rule, very light in color. It possesses a slightly sweet odor, and an insipid, but not unpleasant taste, which, however, leaves a long, lingering, acrid after-taste, and a persistent, dry sensation in the throat. Added drop by drop to alcohol, a red-brown color is imparted, the liquid remaining clear. Water, under the same conditions, becomes dark and semi-opaque. The gradual addition of ammonia water scarcely affects the color of the alcoholic solution, but it instantly clarifies the aqueous mixture, producing a brilliant, red-brown liquid.

THE THERAPEUTICS OF BELLADONNA.

BY J. S. NIEDERKORN, M. D., Versailles, Ohio.

Belladonna is a remedy deserving the most intimate consideration of the up-to-date therapist. It is not necessary that I contrive a scheme in mind, in order to substantiate the assertion that many medical men of to-day know comparatively little concerning the positive medicinal qualities of Belladonna, and less concerning when and how it should be exhibited in order to obtain its real value as a medicine. None of us know it all, but there are too many who do not understand the remedy as they should.

There can be no doubting the fact that the promiscuous prescribing of remedies is incorrect; and by that I mean the practice of prescribing medicines irrespective of real pathological conditions, and that of exhibiting them because some one recommended that they be employed in this or that disease, is no good practice and far from correct.

The laity in general understand that Belladonna is an energetic, narcotic poison, if taken in excessive and inordinate doses;—it is to be noted, and a fact attractive of particular attention, that the doses recommended by many medical men are, if therapeutic effects are desired, exceedingly excessive; for it certainly is one thing to get the physiological effect of a drug, and another to obtain its therapeutic result. And it is also a fact that drugs known to be active poisons may prove to be among our best medicines.

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Belladonna kills by exhausting the powers upon which circulation and respiration depend—it paralyzes cerebro-spinal centers probably more by its primary effect upon the sympathetic, than by its direct effect. Before its paralyzing influence is exerted, its effect as a circulatory and a cerebral excitant is particularly noticeable, cerebral disturbances being exceedingly prominent. Large doses paralyze, small doses stimulate, and it is through its action upon the nervous system that its circulatory effect is obtained. It is said of Belladonna that if given in continued large enough doses to dilate the pupils, its usefulness as a remedy is lost, in so far as concerns its specific action. To be able at all times to exhibit the remedy in such manner and doses as will best exhibit its specific action, is of far more importance to the therapist, than it is to administer it merely to the extent of receiving its physiological effect, and then discontinue its use. Whilst it is true that the physiological effect of a drug is sometimes desirable, it is equally true that the therapeutic, or rather specific action of a remedy is usually what we are interested in. The specific action can best be obtained by the careful observation of pathological conditions which have been known to be relieved by the remedy, the size of the dose, and the employment of a reliable preparation of the drug.

On account of the uniformity of strength, it has been our custom to use the Specific Medicine Belladonna, and at this time we entertain not the least desire to discontinue its use. Thousands of physicians highly esteem that preparation of the drug, and employ it exclusively.

It may be well to advise those unfamiliar with the Specific Medicine Belladonna, that if large doses of the drug must be administered, and specific action is desirable, this preparation of the remedy had best be let alone, for, owing to its energy, results will not be satisfactory, and the preparation will be wrongfully condemned. When dosage is mentioned throughout the following paper, it applies only to the Specific Medicine.

The direct specific indication for Belladonna is impairment of the capillary circulation, with congestion. With this condition always before us, not much difficulty will be experienced to find its exact place in therapeutics. In acute disorders, where there is inclination to dullness or stupor, or where these conditions really exist, pupils dilated, face pallid and expressionless, cerebral congestion, sluggish capillary circulation, extremities cool—all these call for Belladonna, *but in small doses*. It stimulates capillary circulation by its decided influence upon the vaso-motor centers and nerve peripheries; is a direct and powerful stimulant to the sympathetic and

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the heart, exercising a powerful influence in enfeebled heart's action and depression of the sympathetic influence.

Whether child or adult, if during the course of disease our patient shows a decided disposition to sleep, there is dullness of intellect, dilated pupils, oppressed pulse, eyes partially open, all indicative of cerebral congestion, Belladonna is indicated. There is a condition of chilliness, skin pallid, pulse full but oppressed, dull, sleepy headache, indicating capillary stasis, which Belladonna overcomes. Those dull, heavy headaches, where pain is constant and where there is a feeling that if it were not for the pain, the patient could sleep, the remedy promptly relieves.

In cerebral or spinal congestion, acute or chronic, where there is a dull, heavy aching and fullness in the head, drowsiness, eyes dull, pupils dilated, or a condition of apparently threatening apoplexy, Belladonna is a positive remedy. Sore throat, where the mucous membranes have a dark-red, dusky color, capillary engorgement plainly evidenced; at the onset of or threatened inflammatory conditions, pneumonitis for instance, to relieve the capillary engorgement and prevent local effects, the remedy is indicated. Persistent inclination to sleep, accompanied by vomiting, is relieved by it. So is whooping cough, where there is also the characteristic dullness, hebetude, and impairment of capillary circulation.

In the exanthemata, especially the congestive forms, scarlatina in particular, eruptions are tardy, the skin appears congested and patient is drowsy, the remedy proves of true value. In meningeal inflammations, especially in the subacute forms, temperature several degrees above normal, skin cold and moist, eyes dull, pupils dilated, head drawn back, and is being rolled from side to side, eyes partly open during sleep, the remedy is directly indicated. Post-scarlatinal nephritis is a frequent condition relieved by Belladonna; so are other cases of renal capillary engorgements.

In all of the foregoing conditions the remedy proves its best results when given in small doses; from five to eight drops are added to four ounces of water, and this solution is given in teaspoonful doses every hour, or every two hours. The condition commonly called diabetes insipidus, where extremities are cold and there is feebleness of the sympathetic, and incontinence of urine, when there is relaxed tissues and an engorged circulation, Belladonna will cure, but the dose usually is larger—say one-third to one-half drop doses, in children not so much. Its value in night sweats is unquestionable, and to arrest secretion of the mammary gland its action is prompt. I have seen exanthematous eruptions follow the administration of small doses of the drug; these were similar to the eruptions of scar-

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latina, and disappeared promptly with the withdrawal of the drug. And I have seen cases where the usual conditions calling for Belladonna were present, but the pupils were contracted; still, the agent seemed to exercise its usual beneficial effect. Neuralgic conditions, neuralgic dysmenorrhœa, where cool extremities and chilly sensations are marked, will be promptly relieved by the remedy, the dose being somewhat larger. I believe it to be a prophylactic against scarlet fever, if given in small doses; and if administered early in that disease, the eruptions will more readily appear and renal congestion will be avoided.

I believe Belladonna to be particularly a child's remedy, and know that the dose must be small, if beneficial results are to be obtained. Active delirium during fevers, where there is cerebral congestion and surface circulation is markedly sluggish, dusky appearance of skin, will be subdued if the remedy is given in grain doses of the 3x. Deep aching of loins or back, with a sense of heavy fullness, will be relieved by one-third drop doses; so will the aching and chilliness often present during a "cold" or preceding fever or grippe. In constipation, when the sphincter ani is abnormally contracted and there is local capillary congestion and lack of secretion, Belladonna is indicated.

In "run-down" individuals, where there is indisposition to exertion, extremities are cold, nervous debility, when it is desirable to stimulate, this agent alone, or combined with any other indicated remedy, will produce salutary effects.

Belladonna has proven valuable in other conditions farther than those mentioned. Salivary overactivity can be controlled by it; epilepsy or epileptiform convulsions, when congestion exists, are benefited by its use; it is known to cure certain cases of rhus poisoning and erysipelas; mastitis and orchitis are relieved; as an antidote to opium it is well known, and its influence in particular eye affections is pronounced. In eye affections, however, we do not usually depend upon the internal administration of Belladonna for results. Owing to its special adaptability in ophthalmic work, it is customary to exhibit sulphate of atropine, a poisonous alkaloid obtained from Belladonna, and even in the eye, particular care must be exercised in using the alkaloid, in order to avoid doing mischief or irreparable harm. The cases in which atropine is applicable should be selected according to conditions, and these distinguishing points are made clear to us in works devoted to this particular kind of affections.

I have said that the direct indication for Belladonna is impairment of the capillary circulation, with congestion. Feeble innerva-

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tion, feeble and sluggish circulation with tendency to drowsiness or coma, dilated pupils, cool extremities, describe it pretty well. Now, it matters not whether it is the skin, spinal cord, cerebral, cerebro-spinal centers, or where or by what name the disease present has been called; if such conditions as I have mentioned are present, Belladonna is the remedy. It will relieve the array of conditions above mentioned, which we recognize by nature's evident display of distress. But the dose of the remedy must be in the proportion as taught us by experience; small doses must be used if its specific effect is desired.

SPECIFIC INDICATIONS AND USES.

This the remedy for congestion, especially of the cerebro-spinal centers. The indications are: dull eyes, dilated pupils and somnolence or coma. The symptoms calling for the use of Belladonna are usually very plain: the patient is dull and stupid, and the child drowsy, and sleeps with its eyes partly open; the countenance expressionless; the eyes are dull and the pupils dilated or immobile; whilst as it continues respiration becomes affected, and the blood imperfectly aerated.

Belladonna is the remedy for urinary affections, particularly for children, especially when associated with capillary inactivity and a tendency to congestion, throbbing pain in the region of the kidney, and urinal incontinence are conditions in which it proclaims its power. It overcomes spasms of the body orifices. Some forms of whooping cough are relieved by Belladonna, and it is an all important remedy in the exanthemata and in the sore throat of a dry, deep red and swollen character, with great difficulty in swallowing. Mental hebetude and the dull expressionless countenance are very clear indications for Belladonna.

Use.—In congestion of the brain and spinal cord; in congestive disease of any part; in scarlet fever, and in some cases of whooping cough and sore throat.

Dosage.—℞. Belladonna, gtt. v to gtt. x; Water, ℥iv. M. Sig.—A teaspoonful of the dilution every hour.

Poisonous in overdoses.

PRICES OF BELLADONNA PREPARATIONS.

Specific Medicine Belladonna.

¼-lb. Packages.....	60c. each.	By mail, 82c. each.
¾-lb. ".....	\$1.15 "	Not mailable.
1-lb. ".....	2.25 "	Not mailable.

A TREATISE ON Oenanthe Crocata, Crataegus, AND Vegetable Caustic.

The Therapeutic Uses of Oenanthe Crocata are written for this Treatise by E. R. WATERHOUSE, M. D.

The Reproductions are by F. H. FISK, M. D.

The Therapeutic Uses of Crataegus are written for this Treatise by H. P. WHITFORD, M. D.

The Reproductions are by M. C. JENNINGS, M. D. and JOSEPH CLEMENTS, M. D.

The Therapeutic Uses of Vegetable Caustic are by HARVEY WICKES FELTER, M. D.

The Illustrations of both Oenanthe Crocata and Crataegus Oxyacanthus are from the British Flora. That of Crataegus Coccinea was drawn for this publication.

The Description, History, Chemistry and Pharmaceutical Record are by JOHN URI LLOYD.

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| Treatise No. I | embraces Thuja Occidentalis. |
| Treatise No. II | embraces Cactus Grandiflorus. |
| Treatise No. III | embraces Pilocarpus (Jaborandi). |
| Treatise No. IV | embraces Veratrum Viride. |
| Treatise No. V | embraces Chionanthus Virginica. |
| Treatise No. VI | embraces Asepsin and Asepsin Soap. |
| Treatise No. VII | embraces Collinsonia Canadensis. |
| Treatise No. VIII | embraces Nux Vomica. |
| Treatise No. IX | embraces Gelsemium. |
| Treatise No. X | embraces Belladonna. |
| Treatise No. XI | embraces Oenanthe Crocata, Crataegus, and Vegetable Caustic. |
| Treatise No. XII | will embrace Ergot. |

Drug Treatise, Number XI.

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OENANTHE CROCATA.

Oenanthe Crocata.

(HEMLOCK WATER PARSNIP.)

A European herb growing by the side of ditches in wet pastures, thickets, and along the banks of rivers. It is circumscribed in habitat, being confined to the west and south-west of Europe.

Part Used.—The recent root, which resembles a bunch of small parsnips. The juice is yellow, or clear or milky, turning to yellow on exposure. It is said to vary in color with the season. It has a disagreeable odor and an acrid taste. We have no experience with the dried root, our preparation on which the use of the remedy in America was determined, being always made from the imported fresh drug.

In this connection we call particular attention to the variable color of the juice and also to the fact that its qualities unquestionably vary both in accord with the locality the drug is grown and the time of year the drug is collected. This is in harmony with our experience with other drugs.

Constituents.—This drug is destitute of alkaloids. It largely depends for its virulence on a complex resin that is soluble in both alcohol and ether.

Qualities.—Oenanthe Crocata in over amount is an active poison, many deaths, both human and of animals, being recorded from mistakes. It belongs to the narcotic-acrid group of poisons, producing inflammation of the stomach, giddiness, convulsions, delirium and death in from half an hour to three hours after the drug is eaten.

Treatment.—There are no chemical antidotes. Vomit the patient by means of emetics, and follow with demulcent drinks such as flaxseed tea, gruel, slippery elm tea, etc.

Pharmaceutical Preparation.—The Specific Medicine only is made by us. It has a red wine color, little odor, and no characteristic taste. It imparts to water a slight herby odor, but little taste, and does not produce an immediate precipitate. The value of Oenanthe Crocata in America, outside the "Homœopathic" profession, has been determined by the use of our preparation, the

OENANTHE CROCATA.

most conspicuous authority concerned in its introduction being Dr. E. R. Waterhouse, whose experience and suggestions follow.

DOSE AND MEDICAL PROPERTIES.

By E. R. WATERHOUSE, M. D.

No continued study has been made of this drug, and what is known of it has been gleaned by close observation of its action. It is, when administered in unreasonable doses, a very powerful poison, and many accounts have appeared in foreign publications indicating that death has resulted from small amounts of the plant being accidentally eaten.

In poisonous doses it seems to produce paralysis of the vaso-motor nerves, as is shown by the dilated condition of the capillaries, and is evidenced by the reddening of the surface of the body. Excruciating headache comes on with dilated pupils and violent spasms, which continue until death ensues. Some years ago I noticed an account in a magazine, of a traveler in a foreign country who plucked and chewed some of the leaves of the plant. He became dizzy, and unable to proceed farther, and was soon in spasms, became unconscious and died. The entire back of his neck and spinal column assumed a blackish color, thus showing that the action of the poison was such as to cause a violent congestion of the base of the brain and cord. I believe that in these cases the immediate cause of death is a paralysis of the respiratory nerves, while its action upon the heart is that of a stimulant. I have taken small doses of the Specific Medicine as prepared by Lloyd Brothers, and note that the headache produced by an overdose is not unlike that caused by nitro-glycerine. Like nitro-glycerine, some people may take a much greater amount of the drug without subsequent headache than others, and I observe that people who are thin in flesh, and of an extremely nervous make up, are much more susceptible to its action than those more plethoric. Headache should always be taken into account as a guide in the administration of *Oenanthe Crocata*. Begin with the minimum dosage and carefully increase it until the headache appears then drop down until you fall short of its production, when the dose should be so continued for a long time.

In proper doses this remedy seems to steady the circulation of blood in the brain and spinal cord, and thereby give this structure its normal nourishment and promote its functions. My experience gives *Oenanthe* a place as an emergency remedy wherever you

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would think of nitro-glycerine. I used the remedy in one case where there was trouble with the optic nerve with poor sight, and continual sensation as if bits of straws and cob webs were floating through the field of vision. Oenanthe gave prompt relief, and the trouble which had been of considerable duration has never given further annoyance. The remedy should be given further consideration in this direction. I believe that Oenanthe Crocata will prove of value in cases of mal-nutrition of the brain and spinal cord concerning which use of the drug I wrote several years ago. Also where we wish to steady the supply of blood to those parts, which through some faulty condition of the nervous system (that we are so far unable to fathom) needs attention.

We notice just this condition of affairs in most cases of epilepsy, and Oenanthe has done good work in many of these cases, although some of them are not in the least benefitted. It is impossible at this time with the limited observation and study that has been given the subject, to tell exactly what cases will receive benefit, and what cases will not, but one may rest assured that, remembering the headaches as a guide, to the proper dosage no harm whatever can come from its use.

Oenanthe is also to be thought of in cases of locomotor ataxia. It has given a good account of itself in several cases in which I have used it.

The dose given upon the label of the Specific Medicine, I believe, is about right as a starting point, which good judgment will guide to an increase or decrease of the drug.

Specific Uses.—In epilepsy and diseases resulting from mal-nutrition and anæmia of the brain and spinal cord.

R—Oenanthe Crocata, - - gtts. iii to v.
Aqua, - - - - - four ounces.

Dose.—One teaspoonful of the dilution four times a day. Should it produce headache reduce the dose.

The following case, described by Dr. F. H. Fisk, in the *Chicago Medical Times*, is also corroborative evidence of the value of this remedy:—

"Miss H. E. G., æt. 16, sanguine temperament, well-grown, robust appearance, but dyspeptic.

"When 8 years old would have spells of absent-mindedness. Would be listless and inattentive for a few minutes, then would be *all right*. Health at that age good. These absent-minded spells

OENANTHE CROCATA.

would occur at irregular intervals, and recurred up to date of applying to me for treatment for epilepsy. Menstruation began at about the age of 12; epileptic convulsions were manifest about the age of 14, and grew more frequent and more intense with time. Had been under treatment by Allopaths, Homeopaths and Eclectics. For the past six months the patient would have six to ten convulsions in twenty-four hours, if not kept stupefied with bromide of potash. It would require from sixty to one hundred grains per day to control the condition. The mind was beginning to show feebleness, and the functions of the body were subnormal. The convulsions did not occur at or near the menstrual period any more than at other times.

"I prescribed Specific Medicine *Oenantha Crocata*, minims five, water six ounces, mix. Directions: Give a teaspoonful every three hours until there was some complaint of headache, then only every four or six hours, during the day, as would be necessary to control the convulsions. Result, not another spasm. The medicine was continued for three months and then omitted. At that time a little mental excitement brought on a convulsion. The medicine was resumed and continued for three months longer. No more convulsions, and the absent-minded condition had disappeared. The young lady became gay, cheerful, with active mind, and entered society and took part in social entertainments as did other of her associates.

"When the remedy would be withheld for a short time a little mental excitement or mental fatigue would cause an epileptic seizure. The remedy was continued, gradually reducing the dose, for a period of about two years. Since that time more than a year has elapsed, there have been no indications of epilepsy, and no sequelæ. I have treated five other cases with like results."

Crataegus.

(HAWTHORN.)



CRATAEGUS COCCINEA.
[An American species of *Crataegus*.]
Drawn for this publication.



CRATAEGUS OXYACANTHUS.
[English Hawthorn.]
From British Flora.

A thicket tree, of which the species *Crataegus Oxyacanthus* is abundant throughout Europe, being especially cultivated in England as a hedge. It has been successfully introduced into America, where a dozen or more species of *Crataegus* are native, all being marked by close relationship characters.

History.—A well-known physician, the late Dr. Green, of Ennis, County Clare, Ireland, attained an extended reputation in the treatment of "Heart Disease," keeping the remedy a secret. Upon his death, in 1894, his daughter revealed the fact that this "famous" cure was a tincture of the ripe berries of *Crataegus Oxyacanthus*.

The first conspicuous American reference to the remedy was an article by Dr. J. C. Jennings, of Chicago, 1896, in the *New York Medical Journal*, followed by an editorial selection, 1898, which drew further attention to the drug. Our study of the various species of *Crataegus* dates from 1896, at which time, owing to Dr. Jennings' paper, interested physicians sought our services in behalf of an authentic preparation, among these physicians being Dr. H. P. Whitford, whose comprehensive experience is recorded in this

CRATAEGUS.

paper. Possibly we are the only pharmacists to have made a study of the various species and varieties of *Crataegus*, bark, root and root-bark, the result being that we have reason to believe that our efforts have been of much service to physicians, for notwithstanding our questioning the value of *Crataegus* and our fear it might be over-estimated, the preparation under our "Specific Medicine" label has attained conspicuous reputation.

Part Used.—The part used in medicine is the ripe fruit, this being employed by Dr. Green, who used a tincture of the fruit of *Crataegus Oxyacanthus*. When immature the berry, known as "haws," has a green color which on ripening becomes red. It has an astringency, and the fruit of some species possesses a flavor not unpleasant to some persons. When fully ripe, the haws are eaten by children. This is particularly true of some American varieties, one known as "mush haw" being quite palatable. The imported berry is easily obtained, and is readily imported from England, fresh, and in good condition. At first, we made only a tincture, or Fluid Extract of the imported Hawthorn berries, but comparative investigations finally led us to the conclusion that this berry is inferior to one of the American species, and accordingly we finally placed the Specific Medicine of that *Crataegus* berry on the market.

Preparations.—*Crataegus* berries are worked by different methods, and by means of different menstrua. They are sold under various labels, such as Tinctures and Fluid Extracts of *Crataegus*, and they vary markedly as found in commerce. We supply under the name *Crataegus* the afore-named Specific Medicine unless other preparations are directly specified, such as tincture of the European Hawthorn berry, or tincture of Hawthorn bark or of the root when we supply such as are designated. In this connection we will add that the bark and root were both shown by our investigations to be therapeutically valueless in the field the berry occupies.

Specific Medicine *Crataegus*.—This preparation has a brown-red color, a fragrant, wine-like or fruity odor, and a pleasant taste. It gives an acid reaction, and when dropped into water mixes without precipitation. It cannot, as is the case of so many heart-tonics, be classed with poisonous remedies, for its sensible characteristics are not marked. We consider this the typical and best preparation of *Crataegus*. It can be taken in large doses for a long period without impairing digestion or producing other ill effects, and it has no cumulative action.

Medical Properties of *Crataegus*.—Prof. Felter (Amer. Disp.), states that the field in which this remedy is claimed to be of

CRATAEGUS.

value is that of "a curative remedy for *organic and functional heart disorders*, including *cardiac hypertrophy*, with *mitral regurgitation* from valvular insufficiency, and *angina pectoris*. Sometimes *spinal hyperemia* is associated with the latter, when both are said to be relieved by the drug."

Possibly the growing interest in Crataegus may be more comprehensively shown physicians by reproductions of the articles already referred to, together with the report of Dr. Whitford's experience with Specific Medicine Crataegus, than by a summary made by an editor. We, therefore, present these contributions in detail, believing that they embrace the sum of what the friends of Crataegus have to offer in behalf of the claims of the remedy. In this connection we will say that, as in all other cases, indicated remedies should not be neglected.

An excellent example of the value of indicated remedies in fortifying a central preparation is shown in Prof. Bloyer's article on *Cactus Grandiflora*. This we will mail on application.

THE USES OF CRATAEGUS.

BY H. P. WHITFORD, M. D., Bridgewater, N. Y.

My experience with this agent commenced with the commencement of its manufacture by Lloyd Brothers, of Cincinnati, Ohio. Have used the Specific Medicine exclusively in my practice since its introduction. I do not consider it a "cure-all," but no one agent has given better results in its sphere of action. In weak hearts, with consequent capillary congestion, with effusion, even where valves are so diseased as to eventually cause death, it has proved of great benefit. A few *prominent* cases from practice will perhaps best illustrate its value. One of my first trials was in the case of a lady of Babcock Hill, N. Y., who had been suffering for a number of years with ulcerative laryngitis, bronchitis, with involvement of apex of left lung. Was expectorating grumous pus freely, pulse feeble, irregular, and over 100 per minute when it could be counted. Effusion into entire cellular tissue of body and limbs, and abdomen so distended as to interfere with proper descent of diaphragm in respiration. Had been discharged by two physicians as hopeless. No appetite, urine very scanty, could not rest from coughing. Put her upon Crataegus ten drops in wineglass of water four times a day, also very small doses of Aconite, Bryonia and Veratrum, once in two hours. Diet restricted to new milk and fresh eggs. After first week added Specific Medicine Collinsonia and Ipecac to the prescription. There was marked improvement in circulation and

CRATAEGUS.

effusion in a few weeks, which continued until dropsy was entirely gone, and with continuance of the Crataegus alone has never returned. The throat and lung got better, and the lady is as well as most people of 70 years. A year later her husband came under treatment for disease of the heart. Had suffered for 30 years from attacks of suffocation which were increasing in frequency. Heart action very feeble and irregular; effusion in feet, limbs and one hand and arm. Attacks would last from a few minutes to six or eight hours, the intervals between growing shorter, and the attacks holding on longer. The same remedies, Crataegus, with *small doses* of Specific Medicine Aconite, Bryonia and Veratrum, as indicated, soon relieved the dropsical conditions and stopped the suffocating attacks. Patient continued comfortable under the treatment about six months, when he died from paralysis.

A gentleman of Richfield Springs, N. Y., suffered from angina pectoris for a number of years. In June, 1900, he was taken very much worse, having ten attacks during a night, so severe that it seemed that each successive attack must be the last. Had been in the habit of controlling them with ~~10~~ grain tablets of glonoin, but at this time they seemed utterly without effect. Specific Crataegus in ten drop doses once in two hours, alternated with *small* doses of Specific Aconite, Veratrum vir. Bryonia, and Gelsemium as indicated, in half glass of water, two teaspoonsful once in two hours, alternately gave prompt relief and kept them off for two weeks when the medicine gave out.

A gentleman, of Bridgewater, N. Y., 80 years of age, had suffered from increasing heart trouble for eight or more years. In the fall of 1900, he could not lie down at all, limbs filled until the skin cracked open in many places and drip down into his shoes. The right limb about the ankle and on the calf of leg, finally had become gangrenous, the sore on calf being $3\frac{1}{2} \times 6$ inches and very offensive. Pulse very irregular 120 to 130. Had been eating beefsteak, potatoes, toast, preserves, etc., which I changed to milk and eggs, and finally, to milk alone. I gave Specific Crataegus in ten drop doses four times a day in water. A desert spoonful of Syrup of Phosphoric Acid an hour after the milk four times a day. A drachm of Echafolta and ten drops of Glonoin in half tumbler of water, two teaspoonful once in four hours, alternated with ten drops dist. ext. of Apocynum two hours apart. Sores were dressed with compress kept wet with 20 per cent. solution of Echafolta. In two months dropsy was gone, and the sores were healed with the exception of the large one which was reduced to the size of a quarter of a dollar, heart was regular, strength had returned, could lie down and sleep.

CRATAEGUS.

Was bright, cheerful, and able to take care of himself. This, my long experience as a physician teaches me, was a desperate case and a marvelous cure.

CRATAEGUS IN THE TREATMENT OF HEART DISEASE.

BY M. C. JENNINGS, M. D.

Case I—Was that of a Mr. B., aged 73 years. I found him gasping for breath when I entered the room, with a pulse rate of 158 and very feeble; great oedema of lower limbs and abdomen. A more desperate case could hardly be found. I gave him fifteen drops of Crataegus in half a wineglass of water. In fifteen minutes the pulse beat was 126 and stronger, and breathing was not so labored. In twenty-five minutes pulse beat 110 and the force was still increasing, breathing much easier. He now got ten drops in same quantity of water, and in one hour from the time I entered the house he was, for the first time in ten days, able to lie horizontally on the bed. I made an examination of the heart and found mitral regurgitation from valvular deficiency, with great enlargement. For the oedema I prescribed hydrargyrum cum creta, squill and digitalis. He received ten drops four times a day of the Crataegus, and was permitted to use some light beer, to which he had become accustomed, at meal time.

He made a rapid and apparently full recovery until, in three months, he felt as well as any man of his age in Chicago. He occasionally, particularly in the change of weather, takes some of the Crataegus which, he says, quickly stops shortness of breath, or pain in the heart. His father and brother died of heart disease.

Case II—Was that of a young woman. I was met in the hallway of her home, as I entered, with the announcement that she was dead.

I found that she was not quite dead, though apparently so. I put five or six drops of nitrite of amyl to her nose, alternately pressing and relaxing the chest, so as to imitate natural breathing. I soon had her able to open her eyes and speak. I gave her hypodermically ten drops of the fluid extract, and in less than half an hour she was able to talk and describe her feelings. An examination revealed a painfully anæmic condition of the patient, but without any discoverable lesions of the heart, except functional.

The pulse was hardly perceptible for twenty minutes after she received the hypodermic injection; after that lapse of time it grew slowly strong and less numerous, and at the end of half an hour was fairly good.

A chronic dysentery and indigestion, which were responsible for her trouble, having been cured, the heart trouble and nervous state gradually responded to the general improvement until, at the end of ten weeks, the girl was in a perfect state of health.

She received ten drops of Crataegus, after meals, three times a day for one month—after that only occasionally. Her heart trouble, though very dangerous, was only functional, and resulted from the want of proper assimilation of the food due, chiefly, to the dyspeptic state of dysentery.

The forty other cases ran courses somewhat similar to those cited—all having been apparently cured. Yet, I am not satisfied, beyond a doubt, that any of those patients were completely cured, except those whose troubles of the heart were functional, like the second case cited. And it is possible, and even probable, that, in weather of a heavy atmosphere or when it is surcharged with electricity, or if the patient be subjected to great excitement or sudden and violent commotion or exercise, he may suffer again therewith. That the medicine has a remarkable

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influence on the diseased heart must, I think, be admitted. From experiments on dogs and cats, made by myself, it appears to influence the vagi and cardio-inhibitory centres, and diminishes the pulse rate, increases the intraventricular pressure, and thus filling the heart with blood, causes retardation of the beat and an equilibrium between the general blood pressure and force of the beat. Cardiac impulse, after a few days' use of the Crataegus, is greatly strengthened and yields that low, soft tone, so characteristic of the first sound, as shown by the cardiograph. The entire central nervous system seems to be influenced favorably by its use; the appetite increases and assimilation and nutrition improve, showing an influence over the sympathetic and the solar plexus. Also a sense of quietude and well-being rests on the patient, and he who, before its use was cross, melancholic and irritable, after a few days of its use shows marked signs of improvement in his mental state. I doubt if it is indicated in fatty enlargement. The dose which I have found to be the most available is from ten to fifteen drops after meals or food. If taken before food it may, in very susceptible patients, cause nausea. I find, also, that after its use for a month it may be well to discontinue for a week or two, when it should be renewed for another month or so. Usually three months seem to be the proper time for actual treatment, and after that only at such times as a warning pain of the heart or dyspnoea may point out.

Digitalis, in some form, should be used as an adjunct to the Crataegus.—*New York Medical Journal* 1896.

M. C. JENNINGS, M. D., Chicago, Ill.

The *Kansas City Medical Record* for April, contains a paper on Crataegus Oxyacantha in Angina Pectoris, which was read before the Jackson County (Missouri) Medical Society, by Dr. Joseph Clements, on March 25, 1898. Dr. Clements himself was the patient, and he records the onset of the disease and its progress up to two years ago. The attacks came frequently, the interval varying from two to three months to two to three weeks. Dr. Clements says: "I began with six drops, increasing to ten, before meals and at bed time. In twenty-four hours my pulse showed marked improvement; in two or three weeks it became regular, smooth and forceful. Palpitation and dyspnoea soon entirely left me; I began to walk up and down hills without difficulty, and a more general and buoyant sense of security and well-being has come to stay. After three or four months' use of the remedy, beginning over a year ago, and intermitting a week now and then; and an occasional use for a day or two once or twice since, every symptom of the disease has left me, so far as I can know myself. Of course, as to the permanency of these results time alone must declare; it is too recent a cure to be self confident about. As regards the *modus operandi* of the drug Dr. Clements says, but little is as yet known; it has been ascertained, however, that it exercises a remarkable influence over the vagus and sympathetic nerves. Shortly after its ingestion the cardio-inhibitory centers become active, the pulse rate is diminished and the intraventricular pressure is increased, filling the heart with blood, and thus bringing about an equilibrium between the general blood pressure and the heart's impulse."

Specific Indications and Uses.—Functional and organic heart affections, with pain, dyspnoea, præcordial oppression, rapid and feeble heart action; valvular insufficiency; cardiac hypertrophy; marked anemia; venous stasis; angina pectoris; endocarditis following inflammatory rheumatism.

Dose.—One to twenty drops in water three or four times a day. In urgent cases, ten drops every hour or oftener.

Vegetable Caustic.*

Other Names.—Potassæ Sesquicarbonas, Oak Caustic, Mild Vegetable Caustic.

History.—In early European literature, crude potash obtained from wood ashes was commended as a caustic. Because it was derived from wood, the term *vegetable* applies. Its record dates back to ancient times, antedating the art of soap making. In early European medicine, the preparation was often distinguished as "mild" or "strong," in accordance with the amount of caustic potash it contained, the mild being mixed with foreign bodies, especially lime.†

In early domestic American medicine, impure caustic potash was commended as an escharotic, both Thomson and Beach valuing it. For example, Beach (1833) writes, "Caustic potash differs from all other caustics, in exciting no pain or inflammation, except when first applied, and then only for a few moments." Biggs (1847) defines it under the term "Vegetable Caustic" alone, demanding that it be made from hickory ashes. These references apply about alike to all the botanic, reform, Eclectic, and Thomsonian authors.

The first edition of King's Dispensatory (1852) introduced the title *Potassæ Sesquicarbonate* for a caustic made by evaporating a solution of bicarbonate of potassium to dryness, the resultant salt being immediately bottled. This is the "Vegetable Caustic" of modern Eclecticism, and has been extensively used since 1852. To it Dr. King, in his lectures, and also in his American Dispensatory applied the title *Mild Vegetable Caustic*, in contradistinction to the more energetic commercial caustic potash, or potash.

In this connection, it may be said that the utmost confusion has prevailed concerning the nomenclature of the potassium carbonates. The terms carbonate, subcarbonate, and super-carbonate have all been applied to both salts. The term sesqui-carbonate, applied to the bicarbonate at an early day, was adopted by Dr. King for the evaporated product described herein, which produces not the bicarbonate, but an exceptionally pure carbonate. *Sal æratus*, now obsolete, was an impure potassium bicarbonate.

Description.—Chemical theory accepts that only two potassium carbonates exist, K_2CO_3 and $KHCO_3$. It is generally denied that an intermediate salt is possible, and notwithstanding that we

* History and description recast by John Uri Lloyd from the leading editorial by Professor Harvey Wickes Felter, M. D., *Gleaner*, March, 1905.
† See Quincy's "New Dispensatory," 1753, pp. 282, 283.

VEGETABLE CAUSTIC.

have seen it stated that all the CO_2 does not escape if the temperature be less than boiling, our analysis of the product demonstrates that it is practically K_2CO_3 . But, as is known to soap makers, this salt will not under ordinary conditions saponify fat, and yet the experience of physicians and surgeons teaches that it has the power of dissolving disorganized flesh, and of cleaning live tissue by reason of its mildly alkaline qualities. It is more kindly than caustic potash, and more energetic than potassium bicarbonate. No official title applies, or has ever applied, to the carbonate made in this way from the bicarbonate, unless it be King's *Sesquicarbonate* and the common term *Vegetable Caustic*, both of which terms had been previously used with potassium compounds.

THERAPEUTICS OF VEGETABLE CAUSTIC.

BY PROFESSOR HARVEY WICKES FELTER, M. D.

It was quite the medical fashion many years ago to employ caustics and escharotics upon unhealthy surfaces to further the formation of more healthy granulation, and who can deny, when not overdone, such methods were productive of good results. Stimulating antiseptics and the curette have, however, now revolutionized this practice. Many were the caustic agents selected in the olden time, and many of the American practitioners, following the dicta of European teaching, had a strong leaning toward caustic potash, which being of vegetable origin, was naturally called "Vegetable Caustic." Even though it is a harsh agent, Beach, who was always seeking milder agents and methods of practice, lauded it on account of the comparatively slight pain produced by its application. It was used in all strengths, from pure caustic potash, to the cruder compounds made directly by the lixivation of the ashes of hard woods, the oak, the hickory, and the ash being particular favorites. These cruder forms, often referred to as "oak caustic," "vegetable caustic," etc. (see History and Description), were less harsh than the pure caustic potash advocated in the dispensaries, and were upward steps in the evolution of a product which, as has been said, finally came to be almost universally employed under the term *Vegetable Caustic*. Still, these products were but impure forms of caustic potash, and as such had their day. In domestic medicine, and in Reform practice seventy-five years ago, men sought for a yet milder agent to be used in special cases, and finally the pure carbonate, made from the bicarbonate, and called the sesqui-carbonate of potassa, was readily related, settled upon. This became much

VEGETABLE CAUSTIC.

used and was greatly admired, especially by a large majority of the early Eclectic physicians. It was not nearly as caustic as either caustic potash or the crude mixtures of potassium hydroxide and carbonate obtained by the treatment of ashes; it was stimulating and mildly escharotic, and was found to be far more effective than the stronger escharotics then in use. Hence they named it *Mild Vegetable Caustic*. It finally became so universally employed, to the exclusion of the other caustic alkalies, that it was the only vegetable caustic thought of, and since 1852, almost without exception, has gone under the name *Vegetable Caustic*. We do not, however, overlook the fact that other agents have occasionally been employed by herbalists. Thus, the expressed and evaporated juice of the *Rumex Acetocella*, or Sheep Sorrel, and the extract of *Kalmia latifolia* were known by this name; the former was also known by the name Cancer Balsam. Downing (1851) writes, "Vegetable Caustic is made of little wild turnips which are found under the old wild turnips late in the fall, and dried and pulverized." These substances, however, have never had any authoritative recognition.

The reader who may have access to that creditable work and old Eclectic guide, Professor I. G. Jones (Jones' & Morrow's) "Practice of Medicine," will have but to turn to pages 479 to 492 to obtain a fair knowledge of the use of escharotics as practiced in the early days of Eclectic Medicine. For those who have not this work, we shall condense Dr. Jones' statements into a very few lines. It will be observed how great was the caution, and how careful the procedure, as compared with the very earliest uses of escharotics. In considering fissure of the rectum, just at that time becoming recognized as a distinct surgical condition, Dr. Jones remarks:

"Those cases presenting the *callous edges* with an indolent general appearance will be more promptly relieved by the application of the oak caustic. I should remark that the edges and unhealthy granulations should be barely touched with the caustic, as more than this will be certain to produce too great a cauterization, . . . The part to which the caustic is applied immediately turns dark, when it should be washed off with diluted vinegar, to prevent its further action; and you should be very particular to see that the application is entirely confined to the points desired. One application of the caustic will usually be sufficient, as when the morbid structure, destroyed by the application, comes away, the fissure will present a soft and healthy flesh-colored appearance, and with other mild and simple means will be very shortly cured. The application of the caustic should be followed by a soft slippery elm poultice to the rectum, and the patient advised to keep still for a few days in order to allow the irritation to subside, and afford greater convenience in changing the poultice, which should be done three times a day. After the irritation has disappeared the parts may be washed two or three times a day with a decoction of *hydrastis canadensis*, and then dressed with any simple plaster, such as our black salve or the yellow ointment."

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If this procedure was not successful in removing the induration and exciting healthy action in the parts, or "if fungous granulations should sprout up," he advises that the "parts may be washed every second day with a saturated solution of the sesquicarbonate of potash. . . . In less severe cases, not exhibiting the callous and indolent edges, the application, for a few times, of sesquicarbonate of potash in the form of a dry powder, by filling the fissure with it, and the subsequent use of hydrastis will obviate the necessity of the more severe application of the caustic."

Such was the procedure and such was the care the Eclectic fathers advocated in cases where extreme measures were often thought necessary by members of the rival school of medicine. The general uses of sesquicarbonate of potash may be quickly gathered from the following extract from Jones' (Lorenzo E.) and Scudder's *Materia Medica*."

"This preparation of potassa is a mild but exceedingly valuable escharotic. It is much too mild for the formation of issues, destruction of tumors, chancroid growths, etc., and for opening abscesses; but as a topical stimulant and feeble though certain escharotic in cases of old, indolent ulcers, fistulous openings, or pipes, chancre, opacity of the cornea, chronic inflammation of the conjunctiva, chronic eruptions, such as tetter, ringworm, etc., it surpasses most, if not all, the other escharotics with which we are acquainted. The powder is applied to the ulcerated surface mostly; if too active, a solution may be employed, the strength being graduated to suit the case."

Again Professor Scudder says in his "Specific Medication," p. 209:

"This has proven one of the most useful remedies in our materia medica, and I do not care to give it up, though it is declared to be an imperfect chemical product. One who has used it will be satisfied that we have yet nothing that will take its place. In chronic disease of bone, and in caries, it exerts a most kindly influence upon the diseased tissues, promoting the removal of the dead bone, and at the same time stimulating the living. In disease of the soft tissues going on to suppuration, the same may be said, the local application promoting the removal of dying tissue in suppuration, yet strengthening the tissues adjoining. This may be noticed especially in the treatment of carbuncle, as the thorough injection with a saturated solution of sesquicarbonate of potash arrests the progress of the disease, and establishes healthy suppuration. In using the remedy for these purposes we usually employ a full strength solution thoroughly applied, or in some cases the powder is applied."

We have gone thus extensively into this subject of this old Eclectic remedy in order that the uses of Vegetable Caustic, gathered from original sources, as given by the early Eclectic authors, may be once more placed upon record. To them is due the credit of its popularity, and even in these days of rapid shifting from one topical agent to another, we still find it in constant use by many of the older physicians, and always under the name Vegetable Caustic.

MATERIA MEDICA STUDIES.

The accompanying Treatise is part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our complements, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of Materia Medica, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressively for these fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional.

The history, description, pharmacy and chemistry will be written by John Uri Lloyd.

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LLOYD BROTHERS, C^o

A TREATISE ON ERGOT.

The Therapeutic Uses are written for this Treatise by A. B. CONKLIN, M. D., of Ambler, Pa.

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Treatise No. I embraces Thuja Occidentalis.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. III embraces Pillocarpus (Jaborandi.)

Treatise No. IV embraces Veratrum Viride.

Treatise No. V embraces Chlonanthus Virginica.

Treatise No. VI embraces Asepsin and Asepsin Soap.

Treatise No. VII embraces Collinsonia Canadensis.

Treatise No. VIII embraces Nux Vomica.

Treatise No. IX embraces Gelsemium.

Treatise No. X embraces Belladonna.

Treatise No. XI embraces Oenanthe Crocata, Vegetab. Caustic and Crataegus.

Treatise No. XII embraces Ergot.

Treatise No. XIII will embrace Macrotys.

Drug Treatise, No. XII.

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Ergota or Ergot.

(Blasted Rye.)

Common Names.—Ergot of Rye or Spurred Rye (derived from the French word *argot*, a cock's spur); Mutterkorn (German), relating to its use in parturition; Blasted Rye, because of the erroneous impression that Ergot is a grain of blasted (abnormal) rye.

History.—This drug, from the earliest period, has been known as a disturber of flour, it having been long since observed that flour made of rye containing Ergot gave rise to the disease now known as Ergotism. When we consider that many of the malignant epidemics and frightful pestilences recorded in the history of mediæval Europe, including an epidemic occurring as late as 1816, were ascribed to Spurred Rye, it can be seen that such old terms as "Convulsivus Malignus" and "Morbus Spasmodicus," once applied to the Ergot disease, were well chosen. Not till 1838, however, was the nature of Ergot authoritatively determined by Queckett in his paper read before the Linnæan Society, titled "Observations on the Anatomical and Physiological Nature of Ergot in Certain Grasses." Before that date, although recognized as a fungus, the stage known as Ergot was considered a distinct species.

Medical History.—As with all natural drugs, so with Ergot. It is a gift of domestic medicine, and was first mentioned by Adam Lonicer, Frankfort, Germany, who (1565) ascribed to it obstetric virtues, on the authority of women who considered it of "remarkable and certain efficacy" (Flückiger). The English botanist, Ray (1693), alludes to its medicinal properties; a Dutch physician, Rathlaw, employed it in 1747; Desgranges, of Lyons, praised it in 1777; while Dr. John Stearns, of Waterford, New York, 1807, under the name "Pulvis Parturiens," highly commended it in a paper contributed to the Medical Repository, which gave Ergot the American introduction that, supported by other authorities, pushed the drug into prominence.*

Life History.—Ergot of Rye is a morbid growth, caused by the microscopic fungus *Claviceps purpurea*, which, during its life

*Dr. John Stearns, the man who introduced Ergot to American practice, was born in Wilbraham, Massachusetts, May 16, 1770. He graduated from Yale in 1799, studying medicine with Dr. Erasmus Sargeant, of Stockbridge, until 1802. He then attended the University of Pennsylvania, but probably did not graduate, as in 1803 he began to practice medicine near Waterford, New York, marrying in 1807 the daughter of Col. Heskiah Ketchum. He became enthusiastic in behalf of medical societies, and was a leading spirit in the passing of the New York Medical Law, 1846. When the Medical Society of the State of New York was established, Stearns, being a leading spirit, was elected Secretary, filling the position for several years. In 1812 the regents of the University at Albany (where he then resided) conferred on him the honorary degree of Doctor of Medicine. He was elected President of the Medical Society of New York four times successively, 1817, 1818, 1819 and 1820. In 1819 Dr. Stearns moved to New York City, where in 1816 he was a leading spirit in organizing the New York Academy of Medicine, being elected the first President. He died of 1 —————, the result of a wound, March 18th 1848.

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course, passes through three periods, the second of which is known as Ergot. It is in reality a disease product of fungus infection in rye.

1st Stage.—In the flowering period of Rye, one or more of the ovaries are observed to be covered with a sweet mucus, long known to farmers by the name of *Honey Dew of Rye*. This is a secretion due to the attack of innumerable microscopic propagative spores called *conidia*. (Fig. 1.) After a few days the sweet liquid disappears, a white spongy tissue, the *mycelium* of the young fungus, having both covered the ovary



FIG. 1.

2.—Highly magnified section, showing Conidia forming at the tips of the hyphae.
3.—Germinating Conidia.



FIG. 2.

FIG. 3.

The lower parts of these figures show the Ergot with the shrunk dead fungus-infected ovary above. Illustration 3 represents an Ergot transversely sliced below.

and permeated the natural structure. At this stage no starch is present, and none forms thereafter. This, the primary period of the fungus, was once considered a distinct plant, and was named *Sphacelia segetum*, but it is now recognized as the *conidial* stage, or first form of *Claviceps*, the fungus of Ergot.

2d Stage.—The hyphae (Fig. 1) of the *Sphacelia* begin now to unite at the base of the ovary. A purplish-black body results, which rapidly grows in length, forming, apparently, an abnormal, black, horned grain of rye. It thrusts upward the shrunken ovary (Figs. 2 and 3), bursts outside the glumes (Fig. 4), and becomes a black spur in the head of grain, thus giving the drug its common name, *Spurred Rye*. This, the second or resting stage of the fungus, is Ergot (Fig. 5). To Mycologists, it is known as *Sclerotia*.

3d Stage.—The matured Ergot (*Sclerotia*), having fallen from the head of rye, lies dormant on the ground for three or four months. A number of protruding grains likened to little hillocks (*Stromata*) now appear (Fig. 6). Bursting through the dark skin, these grow out like thick-handled drumsticks, each bearing a plump, violet-colored head (Fig. 7).

Finally the head (stroma) in turn becomes studded with minute, wartlike papillae (Fig. 8), each having a minute hole in its apex. The hole in the papilla



FIG. 4.

FIG. 6.

4.—Ergot after dispossessing the Rye-grain of its home. The imperfect ovary is borne upon the tip of the Ergot.
6.—Stromata just protruding.

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leads down to an egg-shaped cavity (perithecia) filled with spore cells (asci), which hold a number of threadlike spores known as asco-spores (Fig. 9). These escape, are wafted by the wind, and coming in contact with the flowers of the new crop of rye, infect them, producing a new crop of Ergot.

Description.—Ergot of commerce is from one-third to one and one-half inches long. The grains, seldom round, are usually tapering, horn-shaped, firm, tough, somewhat elastic, and difficult to pulverize.

(Fig. 10.) They are generally cracked or fissured, the large grains being usually mealy on the concave side. Externally dark brown or black, Ergot is internally white, cream colored, or pinkish. If old or poorly preserved, it is likely to be worm-eaten. The odor of Ergot is



FIG. 5.
a.—Ergot in Wild Rye.
b.—Ergot in Cultivated Rye.

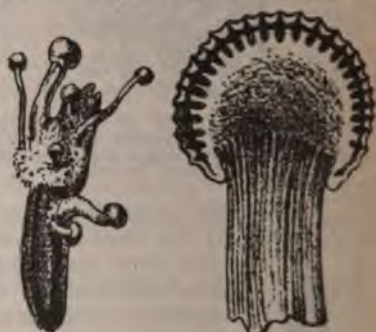


FIG. 7.
7.—Stromata further developed.
8.—Magnified vertical section of upper part of Stroma.



FIG. 9.
Three perithecia full of asci, or spore cells. One of these has burst and the threadlike spores (asco-spores) are escaping. Highly magnified.

"mousy," and is to some persons disagreeable, but not to the writer of this paper. Pulverized Ergot rapidly deteriorates, owing largely to its oil becoming rancid. Powdered Ergot, especially if moistened,

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spoils in a short time, owing to the fat putrefying. The odor is then offensive and carrion-like. The quality of Ergot is greatly injured



FIG. 10.
Ergot of Commerce,
natural size.

by age. This is especially true of powdered Ergot, owing both to the attacks of insects, and to the increasing rancidity of its fat. Possibly few drugs vary so much in quality as does Ergot, and without doubt no pharmaceutical preparation depends more on the knowledge and judgment of the experienced selector of the crude drug for its discriminative valuation, than does Ergot. It may be added that the knowledge necessary to its selection is not easily imparted, nor can the knowledge gained by experience be well

formulated into printed words. Ergot of commerce is supplied mainly by Spain and Russia.

Constituents.—Notwithstanding the time that has been spent in destroying it by chemical methods, Ergot has never been structurally analyzed. Since Model, of Strasburg (1766), made his investigations, many persons have given it their analytical attention, attacking it by heroic methods, such as the use of acids, alkalies, high temperatures, and other disruptive agencies and methods. The qualities of numerous products so produced have been recorded, with acrimonious discussions that have exhausted the patience of the investigators as well as their readers. If the chemical ultimates cited as Ergot products exist as such in Ergot, that fact is not established by their use in therapy. Nor do the re-mixed products of the chemical manipulation of Ergot parallel the parent. No alkaloid, glucoside, resin, fat or mixture of such represents Ergot. As is true of the majority of plant structures, chemistry applied to Ergot is productive of structural butchery. The chemist annihilates intricately blended compounds that are so delicately balanced as to forbid his intrusive touch. Notwithstanding our suspicion and distrust of these Ergot derivatives, our article would scarcely be courteous to others, or fair to ourselves, did we not mention the principal Ergot products.

Substances Announced as Ergot Constituents.—They are as follows: Sclerotic acid, Scleromucin, Sclererythrin, Scleroidin, Sclero-crystallin, Scleroxanthin, Ergotin (a mixture of substances), Echoline and Ergotine, Ergotie acid, Ergotinine, Fusco-sclerotic acid, Cornutice, Sphacelic acid, Sphacelotoxin, Secaline, Trimethylamine (Propylamine), Methylamine, Fixed oil, Resin, Cholestrin, Lactic acid, Formic acid, Acetic acid and Choline.

Of the foregoing, Sclererythrin is a red coloring matter. Ergotin is an indefinite mixture (see "Ergotin"), Echoline and Ergotine are alkaloids which Dragendorff considers identical, and also considers of

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no therapeutic value. Sphacelic acid is also known as Sphacelotoxin, whilst Secaline is known both as Trimethylamine and Methylamine.

In our opinion, chemistry should be altogether avoided with Ergot. Neither acid nor alkali is admissable in its manipulation. One substance, however, that exists in the drug is not a part of the medicinally useful structure, and can be eliminated from Ergot preparations by neutral solvents. This is the fat, which constitutes about thirty per cent of the crude drug, and should always be excluded. The mineral salts (Phosphates, etc.) must also be excluded from hypodermic preparations of Ergot. They constitute about five per cent of the drug, and if present produce great local irritation.

PHARMACEUTICAL PREPARATIONS.

Fluid Extract.—This preparation is the Pharmacopœial Ergot representative. It established Ergot in the Regular School, and we take pleasure in recording that the efforts of the late Dr. Edward R. Squibb* did more to favor it than all else combined. What Dr. Stearns was to the introductory therapy of Ergot, Dr. Squibb has been in its pharmacy. He studied it, experimented with it unceasingly, and published articles regarding it in the *American Journal of Pharmacy* and *Proceedings of the American Pharmaceutical Association*, and elsewhere. He devised a fluid extract that was exceptionally reliable, he exercised the greatest care in his selection of crude Ergot, and he established the name "Squibb's Ergot" in the Regular School of medicine as firmly as he did "Squibb's Ether" and "Squibb's Chloroform" in all schools. The medical profession, regardless of section, has reason to extend to Dr. Edward R. Squibb their fullest tribute of praise, especially for his monumental work in the direction of anesthetics, and we believe that in saying this we voice the opinion of the entire Eclectic medical profession. In Eclectic literature, the name Squibb,

*Dr. Edward R. Squibb was born in Wilmington, Delaware, July 4, 1819, and died in Brooklyn, October 25, 1900. His early education embraced such branches as could be studied in the common schools of Wilmington. At the age of eighteen his apprenticeship in pharmacy commenced with Warner Morris, a druggist in Philadelphia. In 1842 he matriculated in Jefferson Medical College, where he graduated March 20, 1845, and was at once elected Assistant Demonstrator of Anatomy, Curator of the Museum, and Clerk of the Clinic. Dr. Squibb practiced Medicine in Philadelphia until 1847, when he passed the examination to enter the Navy, receiving his commission as Assistant Surgeon, 1847. He served four years in the Navy, whence he was ordered to the Naval Hospital in Brooklyn, where Dr. Benjamin Franklin Bache was Director. Dr. Squibb had noticed the poor quality of medicines in the Navy, and, together with Dr. Bache, influenced Congress to make an exception in the case of both medical supplies and gunpowder, placing quality first and price second. The Navy Department was next induced to establish a Pharmaceutical Laboratory, 1852, for the purpose of making naval supplies, Bache being Director and Squibb Assistant Director. Ether, which was afterwards one of Dr. Squibb's specialties, was here manufactured by the use of steam, the subject of Anesthetics being then in its infancy.

In 1857, Dr. J. Lawrence Smith, of Louisville, Kentucky, arranged for Dr. Squibb to take charge of a laboratory in Louisville, Squibb resigning his Commission for that purpose. Next, in 1858, Dr. R. S. Satterlee, Chief Medical Purveyor of the Army, induced Dr. Squibb to establish, in Brooklyn, a laboratory to supply the army with such products as might be required in his direction. This laboratory was destroyed by fire in 1858, through an explosion of ether, which badly burned Dr. Squibb, disfiguring his face and causing him lifelong suffering. This fire wrecked his fortune, but the medical profession came to his rescue, furnished

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especially in connection with ether and chloroform, has ever been mentioned as that of a benefactor.

Fluid Extract of Ergot, U. S. P., should practically represent the drug, minim to grain. It contains a small amount of acetic acid, the impression being that this substance fixes the trimethylamine (propylamine.) But in our opinion it is unnecessary. If the acid is in much excess, we believe it acts finally as a disturber of the structural equilibrium of the fluid. Certain it is that propylamine is freely evolved, when caustic potash or soda is added to a preparation of Ergot free from acetic acid.

Solid Extract.—This is made by evaporating the fluid extract to a pilular consistency. It carries practically the full value of the fluid extract, because quickly applied heat does not injure Ergot preparations. Its solid condition, which is not as conducive to assimilation as is a fluid, is a therapeutic disadvantage, and when practicable, it is best to dissolve the extract in hot water before administering it.

Ergotin.—This term is a misnomer, if the material so labelled is supposed to be a substance of definite composition, but is fairly correct if used to indicate an Ergot compound that is devoid of certain impurities found in the fluid extract. But even then, the term "Purified Extract" would more consistently apply to the various so-called Ergotins. Of these, several have been introduced, the first being *Bonjean's Ergotin*, which is probably the best known. It is in the form of a pasty, semi-solid mass. *Yvon's Solution* is fluid. The advantage of such preparations as these resides mainly in their freedom from alcohol and the inorganic irritants present in the fluid extract, as well as in their more concentrated condition, owing to the absence of extraneous bodies. The disadvantage of Ergotin lies in the fact that it is too thick for hypodermic use, and must be liquified, when, as is well known, it is almost impossible to avoid solid particles, which refuse to re-dissolve. (See "Lloyd's Ergot," p. 8.)

Specific Medicine Ergot.—For several decades this preparation has been a favorite in the Eclectic School. It differs from the official fluid extract in particulars that seem to us to be of importance;

him capital, and, in 1859, his laboratory was rebuilt. From this date, his well known energy, his constant investigation, his fairness and exactness in methods and business, led him onward and upward until, as already stated, the products of his establishment became celebrated throughout the civilized world.

Dr. Squibb was an influential member of the American Pharmaceutical Association, which he joined in 1858. He wrote numbers of papers, his contributions to the *American Journal of Pharmacy* and the *Proceedings of the American Pharmaceutical Association* covering volumes. He made exacting experiments, and recorded the results thereof for the benefit of the world. He spent thousands of dollars devising better apparatus to replace that which was already good, and he took an active interest in pharmaceutical methods and education, especially concerning the pharmacopoeia of the United States. Naturally, he gave his three children exceptional educations. His two sons follow in the business their father established, and maintain the high degree of integrity that is their birthright.

The writer of this note considers that the efforts of Dr. Squibb have done more to serve American Pharmacy than those of perhaps any other man. Arm in arm with such men as Proctor, Parish, Taylor, Maisch, Remington, Ebert, Rice, and others, he was ever one to contribute to the extent of his opportunity and ability. If Dr. Squibb had done nothing more than give to the world the blessing that came from his investigating exactness with chloroform and ether and aconite and Ergot and salicylic acid, the last of which he was the first American manufacturer, this alone would have been a monument that his family might ever regard with pride and his friends with admiration. In addition to the foregoing, among the special subjects of Dr. Squibb's investigation may be named opium and its products, reprecipitation as applied to fluid extracts, acetic acid and its pharmaceutical uses, alcohol, etc.

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among which may be named the fact that it is free from both acetic acid, and from Ergot fat. Being alcoholic in nature, it is not adapted to hypodermic injection (see "Lloyd's Ergot"), but it carries the full therapeutic value of the drug, and as an Ergot pharmaceutical preparation designed for internal use, we believe it about perfect.

Specific Medicine Ergot has a deep, brown-red color, with the strong odor of Ergot, as well as its taste, but is not salty. Mixed with alcohol it becomes milky, the mixture darkening and precipitating on standing. With water it mixes transparent, in all proportions, imparting thereto a rich yellowish, or as the proportion of Ergot increases, a red color. With diluted alcohol it mixes clear, in all proportions. Caustic potash or soda added to it develops the odor of trimethylamine (*fishbrine odor*.)

Lloyd's Ergot.—This is the preparation preferred by Dr. Conklin, contributor of the article on the Therapeutics of Ergot of this drug study, and it has the following history:

About twenty-five years ago, Professor W. H. Taylor, M. D., of Cincinnati, applied to the writer for a special Ergot preparation for hypodermic use. Experimentation resulted in a preparation that Dr. Taylor prescribed under the title, "Lloyd's Ergot." This contains no fat nor alcohol, and is practically free from inorganic salts. Its menstruum consists of glycerin and water, to which is added, as a preservative and germicide, one-fifth of one per cent of phenol. Each minim represents the qualities of one grain of Ergot, according to our study of the drug. The accompanying statement, which we have as yet seen no reason to alter, was made on the label twenty-five years ago:

"The highest authorities agree that we have here the true, active principles of Ergot. We do not claim to have identified each proximate constituent. We believe that the value of Ergot depends upon an unbroken association or combination of peculiar and as yet unknown constituents. The delicate equilibrium is easily destroyed, and will not permit of contact with strong chemical agents. By a careful and exhaustive investigation of years' duration, we are enabled to eliminate the inert and acrid principles, and present in an unchanging condition (as a solution), those that are therapeutically valuable."

No report of local inflammation or irritation has been recorded of Lloyd's Ergot. It is used internally, as well as hypodermically. Of it Dr. Taylor writes as follows:

"For several years, I have used Lloyd's Ergot exclusively in my practice, and always carry it in my obstetric bag. I administer a dose at the termination of every normal labor, and in case of hemorrhage to any serious extent, use it by hypodermic injection. My reasons for preferring it are its permanence, therefore its reliability, its adaptation for use, either by the mouth or by subcutaneous injection, and its non-irritating quality."

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THE THERAPEUTICS OF ERGOT.

BY A. B. CONKLIN, M. D., AMBLER, PA.

While I freely accord to others the right I claim for myself, viz.: the right to choose whatever preparation of Ergot meets the requirements of the prescriber, I insist that, if the full therapeutic results are to be expected, a preparation must be employed which represents the full therapeutic properties of the drug. These I am satisfied are not possessed by any alkaloid or other so-called active principle of Ergot.

I have been a great admirer of Ergot for years, and have made a liberal application of the drug, aside from its obstetrical uses, which, by the way, should be its most limited use; and the uniformly good results I have had from Lloyd's Ergot (see p. 8) have led me to look upon it as a most reliable fluid form of the drug. It may be used either by the mouth or hypodermically, and throughout the following article I beg to be understood as speaking only of such therapeutic action as I have gotten from this particular preparation, admitting at the same time that there may be other preparations of the drug from which as pleasing results may be had.

Ergot, when taken into the human economy, shows a dual action, which is fairly proportionate to the size of the dose or the length of time during which the drug is taken. The one represents its influence over purely physiologic functions, and should be interpreted as the true physiological action of the drug, while the other is truly pathological and represents the toxic action of Ergot—ergotism.

Since the therapeutic application of Ergot never requires the production of its toxic effects, these phenomena need not now engage our attention; but for the reason that the specific indications for its use are such as call for the production of its physiological action, we shall profit in our study of the therapeutics of Ergot by studying briefly, first, its physiological action. While Ergot has a wide range of action, its every therapeutic possibility is to be explained by its influence upon a single type of tissue, *unstripped muscular fiber*. We may summarize the action of Ergot thus: it imparts tonicity to, and causes contraction of, unstripped muscular tissue.

And what is the distribution of this kind of tissue? It comprises the muscular coat of the arteries, veins and lymphatics, but not the heart; the muscular layer of the skin and mucous membranes, the muscular portion of the trachea and bronchi, alimentary tract below the middle third of the esophagus, including the gall bladder and common duct, the pelvis of the kidney, the ureters, bladder and urethra, the generative organs of both male and female, the iris, Wharton's duct and the capsule and trabeculae of the spleen.

Thus is mapped for us the sphere of its action, and a careful estimate of the results of stimulating the contraction of these various organs and tissues will suggest the *rationale* of the most widely diversified curative action of Ergot, and point possibly to yet untried uses of the remedy. Nor is it essential to a clear comprehension of the therapeutics of Ergot that we be able to say if it have a direct action upon the muscle, or if it be indirectly through its nerve supply, though it is probably the latter, as it is known that the blood vessels are under the control of vaso-motor nerves, and Ergot is, furthermore, known to impress the motor centers to the extent of inducing convulsions when given in

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toxic doses. *With no other remedy, perhaps, is it more true that the specific indications for its use are confirmed by the physiological action of the drug.*

Broadly speaking, the organs mentioned as possessing unstriated muscular tissue may be conveniently classified into two distinct groups, which cover the entire range of action of Ergot, (1) the organs of circulation, and (2) the remaining hollow viscera.

Bearing in mind that the distribution of the unstriated fiber in the blood vessel is in its circular coat, its contraction, as may be seen, produces a lessening of the diameter of the vessel—a narrowing of its lumen. Again, bearing in mind that the most liberal distribution of muscular tissue is in the arteries, and furthermore, that it increases inversely as the size of the vessel, it becomes readily apparent that the action of Ergot upon the blood vessels is very largely its action upon the arterioles and smaller arterial trunks alone.

An inevitable result of thus contracting the peripheral circulation is to dam back the blood stream, thus raising blood pressure and putting more work upon the heart. Following the use of Ergot, it is true the heart's action becomes slower and more forcible, from which it has been assumed, though erroneously I think, that Ergot exerts a direct tonic action upon the cardiac muscle. A moment's reflection will show that the modified heart action is but the logical sequence of the increase in blood pressure, in keeping with Marey's law; and thus it is seen that the action of Ergot upon the circulation is its action upon the blood vessels only. The heart does not possess unstriated muscular fiber.

The therapeutic results derived from the action of Ergot upon the circulation are brought about either, (1) directly by its action in contracting the vessels, as in the relief of hemorrhage, checking mucous fluxes or undue glandular activity; or, (2) indirectly by increasing blood pressure, as in the relief of shock and heat exhaustion, or by overcoming the pressure upon extra-vascular tissue, as in the relief of congestive migraine and dysmenorrhea.

As elastic tissue predominates in the blood vessels of the lungs proper, while muscular tissue is relatively scant, and as these vessels are not supplied with vaso-motor nerves, it is hard to conceive how Ergot could influence them to contract, hence its doubtful utility in hemoptysis, as attested by so many clinicians, though of unquestioned value in many other forms of hemorrhage.

Bronchial hemorrhage, epistaxis, bleeding gums, hematemesis from simple ulcer or cancer; hemorrhage of the bowels from simple ulcer, cancer, typhoid fever or chronic diarrhea; hematuria, metrorrhagia and capillary hemorrhages in general may be very well controlled by the use of Ergot in $\frac{1}{4}$ to 1 drachm doses every $\frac{1}{2}$ to 3 hours, according to the urgency of the case. In profuse non-traumatic hemorrhage, a single hypodermic injection of Lloyd's Ergot, in dose of a drachm, is to be preferred for its more prompt action.

In cerebral apoplexy from vascular rupture, no single remedy is of more value in contracting the torn vessel and controlling the hemorrhage than is Ergot. Another strong indication for Ergot in such cases is the condition of shock, which will be more fully discussed later. Here again the full hypodermic dose should be employed at frequent intervals, until its full physiological effect is apparent, as the cerebral nausea and vomiting that usually occur render all medication by way of the stomach very unreliable.

The condition of the circulation in extreme shock or collapse is the picture of vaso-motor paresis, while such additional symptoms as an involuntary escape of the urine and feces tell the tale of parietic relaxation of the sphincters, also unstriated muscular tissue. The pale, cool, relaxed skin, with perspiration

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oozing from every pore and a discharge flowing from every mucous surface; the pulse soft, rapid and compressible; and the heart action rapid, feeble and lacking in force, all imply a lack of tonicity in unstriated muscular tissue.

I am satisfied the physicians are far too few who sufficiently appreciate the value of Ergot in the relief of shock. Nor does it matter whether the circulatory symptoms of shock are of traumatic, surgical or emotional origin, or occur from heat exhaustion, cholera in its algid state, collapse from cholera infantum or cholera morbus, as a part of a congestive chill, at the crisis of typhoid fever when relaxation is profound, in extreme anesthesia narcosis, or in alcoholic inebriety. The condition of the circulation is the same in all, differing only in degree, and no other remedy meets it so well as does Ergot. Belladonna probably comes as near it as any, and may sometimes be used with it to good advantage.

I would state the special indications for Ergot thus: a pale, cool, relaxed skin, bathed in cold, clammy perspiration, the mucous secretions being likewise increased, with involuntary passages from the bowels and bladder. The pulse is soft and easily compressed, rapid, feeble and possibly intermittent. The heart's action is increased in frequency, but lacking in force, and well expressed by the word fluttering. Its cavities are not filled, and the heart lacks blood on which to act, instead of being itself weak. The blood vessels must be made to return to their normal caliber, thus restoring blood pressure and returning to the heart a normal volume of blood, when it in turn will take on a firm, steady action.

In striking contrast is the case calling for heart stimulants. With it the heart is relatively weak in relation to the work to be performed. Either a weak heart is struggling to maintain the normal circulation or a normal heart is being overtaxed with greatly increased blood pressure, or some other impediment to the circulation. In such cases, strychnia, caffeine, digitalis, alcoholics or glonoin, as indicated, are to be employed, but in shock or collapse the hypodermic use of Ergot will give results that can not be induced by the cardiac stimulants.

From the very limited and only recent mention that has been made of its use in surgery, I am persuaded that the value of Ergot in operative cases is not known to the extent that it should be. A few men report having demonstrated that a full hypodermic dose of Ergot, given just before taking an anesthetic and repeated if the anesthetic is long continued, not only greatly lessens the amount of surgical shock, but very much modifies the unpleasant after effects of the anesthetic and so fortifies the circulation as to reduce to a minimum the dangers of anesthesia narcosis. It mitigates the feeling of nausea, controls the retching, and diminishes the frequency of vomiting. The relaxation incident to complete anesthesia involves, to a greater or less extent, the involuntary as well as the voluntary muscles. By preserving the tonicity of the vascular walls with Ergot, congestion is prevented; and if there be no congestion there can be no inflammation, and thus Ergot has a preventive action against post-operative inflammation. In laparotomy cases, where Ergot has accompanied the anesthetic, less trouble than usual has been experienced in getting an action from the bowels, for the reason that Ergot stimulates peristalsis.

In obstinate vomiting following an anesthetic, I have had the very best results from Lloyd's Ergot hypodermically.

Exposure to excessive heat produces two distinct pathological conditions, designated respectively heat stroke or thermic fever, and heat exhaustion. The former is marked by a phenomenally high temperature (110°-115° Fahr.), and

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calls for antipyretic measures; while cases of heat exhaustion show a sub-normal temperature, cold, clammy perspiration, and all the symptoms that go to make up a picture of profound shock and vaso-motor paresis. In these cases, antipyretic measures are emphatically contra-indicated, while Ergot, in drachm doses hypodermically administered, is as strongly indicated.

The specific indication previously named, cold, clammy, relaxed skin, soft, feeble, compressible, rapid pulse, and a weak, rapid, fluttering heart action, are all prominent in the complexity of symptoms. Stimulants seem to be demanded and yet their action is not to be compared to that of Ergot, pushed with a free hand, in overcoming the alarming condition of the circulation in heat exhaustion. Don't give nitro-glycerin, however alarming the case may seem. It only intensifies the vascular relaxation.

The specific indications for Ergot, above given, are to be seen in the algid stage of cholera; in cholera infantum, with collapse; in cholera morbus threatening dissolution; in congestive chill; and in typhoid fever when ending by crisis. In these several diseases it is the condition of the circulation alone that threatens the immediate termination of life, and it matters little then what the name of the disease which has thus paralyzed the circulation. It is a condition that confronts us, not a name. The condition calls for Ergot, belladonna, camphor, capsicum, xanthoxylum, digitalis—remedies that impart tone to the vessel walls, increase blood pressure, and in this indirect manner induce a more vigorous action of the heart, and are to be preferred to the direct heart stimulants like strychnia, alcohol, and especially glonoin, for reasons already given.

Ergot is pre-eminently the remedy for the circulation in those who consume alcoholic drinks. The red nose of the tippler, the visible capillaries upon the nose and cheeks of the steady drinker, and the watery eyes, copious perspiration and edema of cellular tissue, seen in the confirmed inebriate, all tell the tale of vaso-motor relaxation or paresis. It is a condition of the circulation favoring congestion, and when occurring in the brain leads to restlessness, insomnia, high nervous tension and hallucinations.

In delirium tremens, with capillary relaxation, I know of no better remedy than Ergot, given hypodermically, in drachm doses, and repeated at intervals of an hour until its physiological action may be noted; capsicum and hot milk should be given at the same time as freely as the stomach will bear. A single hypodermic of Ergot I have seen to calm a raving maniac from alcoholic intoxication where morphia had failed, and to induce sleep in less than half an hour, when it had not been known for a week, and hypnotics had been tried in vain.

Again the insomnia that comes from simple cerebral hyperemia, whether induced by too close mental application, worry, anxiety or care, is better overcome by Ergot than by the strictly hypnotic drugs. A single drachm dose of Lloyd's Ergot will often insure a full night of perfectly physiological sleep, when insomnia has resulted from too active cerebral circulation.

Dr. Alfred T. Livingston, of Jamestown N. Y., is credited with several interesting articles, appearing lately in journal literature, extolling the virtues of Ergot in morphinism and the general class of drug habits, but of this use of Ergot I can not speak from experience, save in alcoholism.

Functional activity of a glandular organ implies hyperemia of its circulation. All this is physiological, but when the capillaries are in a state of parietic relaxation there is a pathological increase in secretion. Ergot, by controlling the capillary circulation, limits the secretion of the glandular organs. This is its benign influence in checking night sweats, salivation from the use of mar-

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curials, drooling of teething infants, profuse lachrymation, bronchorrhea, chronic diarrhea, the diarrhea of fright (shock), polyuria, menorrhagia, and in checking an excessive secretion of milk. An acute coryza with profuse watery discharge from the eyes and nose may sometimes be very promptly relieved by fortifying the capillary circulation with Ergot, used both locally and internally.

This same property of Ergot of lessening the amount of blood in a part may be utilized to the greatest advantage in overcoming congestion, and thus preventing inflammation. In cerebral and spinal congestion, threatening meningitis, Ergot displays the greatest abortive and curative properties of any drug with which I am familiar.

When meningitis is developed Ergot is still of the greatest service in modifying the inflammation, allaying pain and convulsions, and preventing many unpleasant sequelæ. Its action is similar to that of belladonna, but is to be preferred in proportion as vaso-motor paresis prevails. I would say, belladonna for the earlier stages of congestion, and Ergot in its later stages with vascular paresis. Congestive migraine is another condition illustrating the curative action of Ergot by simply lessening the amount of blood in the part.

Congestion of the stomach producing irritable nausea, retching and painful vomiting, may be relieved more effectually by Ergot hypodermically than by the class of remedies usually employed. Congestion of the bowels giving rise to pain, cramps, tenderness on pressure and possibly watery stools is well met by Ergot.

Congestive dysmenorrhea calls for Ergot. Ergot can hardly be credited with analgesic properties, though it relieves the pain of vascular engorgement by overcoming the cause. It increases blood-pressure, but lessens the pressure of the vessels upon extra vascular tissue including nerve terminals.

In edema of the cellular tissue from impaired venous circulation and engorgement of the lymph channels Ergot may to advantage be combined with such remedies as apocynum, apis, aralia, infusion of digitalis, etc. In erysipelas Ergot may be used where rapid swelling and extreme infiltration of the cellular tissue are prominent features. Ergot to limit local conditions and renal depurants to eliminate the toxic cause, constitutes good treatment for erysipelas.

When occurring in patients of advanced years, in whom a weakened state of the vessels is to be expected, or in those of a plethoric habit, when apoplexy is to be feared, a one-sided headache that pulsates with every beat of the heart and is intensified by bending over, and especially if there is ringing in the ears, injected conjunctivæ, sparks before the eyes and some clouding of the faculties—symptoms showing cerebral congestion—can be relieved almost to a certainty by Ergot, in half-drachm doses, in combination with potassium bromide, in twenty-grain doses, every three to six hours. Where a patient is threatened with apoplexy, Ergot is a physiological support to the cerebral vessels and may save such an one from cerebral hemorrhage.

In aneurism Ergot has long enjoyed some reputation as a curative agent, but opinion has always been divided as to its actual utility. Recalling the relative distribution of muscular tissue in the vessels, we may reason that directly in proportion as they possess this kind of tissue, Ergot may become a support to their dilated walls. Miliary aneurisms may be very largely overcome by the use of Ergot. In aneurism of the aorta I should question its utility, or even the propriety of its use. Ergot increases blood pressure, a condition we desire particularly to avoid in aortic aneurism. I would say, do not give Ergot for aneurism of any vessel of such size that elastic tissue has largely replaced the wa-

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striped fiber in its walls, so that it may not be made to contract under the influence of the drug. In angioneurotic edema Ergot exerts a good influence upon the vessel walls and restores the parietic vessels to a state of normal tonicity, while eliminants remove the cause.

Note that all the indications thus far given for the use of Ergot are such as point to its action upon the organs of circulation. The further indications for its use are such as show its utility in causing contraction of the same kind of tissue found elsewhere than in the blood vessels, as the sphincters and walls of hollow viscera.

Pulmonary vesicular emphysema, in its beginning, may be very favorably influenced by Ergot, in drachm doses every four to six hours. Chronic laryngitis with relaxation of the mucous membrane inducing tickling, violent fits of coughing and catarrhal secretion, the blood vessels at the same time being visibly dilated, is a condition calling for Ergot. Lack of peristalsis and want of expulsive power in the lower bowel is a good indication for Ergot.

Incontinence of urine in the aged, bed-wetting in children, and involuntary escape of urine during fits of coughing, sneezing, or inordinate laughing, mostly with women, may be checked by stimulating a more forcible contraction of the sphincter vesicæ with Ergot in forty- to sixty-drop doses three times a day. In enlargement of the spleen from malaria, Ergot, in combination with polymnia uvedalia, is a better treatment than the latter drug alone.

Ergot imparts tonicity to pelvic tissue. Prolapsus uteri from relaxation of its supports, with or without muco-purulent discharge; chronic subinvolution—boggy uterus—with metrorrhagia and pouching of the vaginal walls, calls for the use of Ergot in doses of sufficient size, repeated at sufficiently short intervals to keep the tissues in a condition of tonicity. Its use, in conjunction with *senecio*, *lilium tigrinum*, *helonias*, or *macrotys*, covers the medicinal treatment of such cases and will cure many.

Tetanic contraction of the uterus, under the influence of full doses of Ergot, injected over the organ or into its walls, will often cause a uterine polypus to wither for want of nutrition, and even be detached and thrown off.

Prolapsus of the rectum may be overcome by stimulating the sphincter ani and rectal walls to more firm contraction by the use of Ergot. Incontinence of feces in those enfeebled from extreme age, exhaustive disease, and even in conditions of partial paralysis may be much benefited by full doses of Ergot. Paralysis of the bowel as well as of the bladder is an indication for Ergot, alone or in combination with *strychnia* for the bowel and *santonine* for the bladder.

A thin, relaxed scrotum, with enlarged veins and cold, clammy sweat, a shrunk, flaccid penis, the glans being cold, and withal a lack of erectile and intromittent power, point to relaxation of unstriped muscular tissue, and call for Ergot in drachm doses three or four times a day. *Spermatorrhea*, due to relaxation of the seminal ducts, finds its physiological antagonism in Ergot. Ergot, deposited among the veins with a hypodermic syringe, is recommended by good authority as a curative measure for *varicocele*. It is not without good effect upon the dilated veins, but the intense pain attending its use will prevent it from ever becoming a popular treatment.

Last, if not least, its value in obstetric practice. It has been used and abused more in labor cases than anywhere else; but out of a vast experience we have learned its legitimate application, and make use of it now almost solely for a single purpose, during parturition, viz.: to prevent or arrest hemorrhage following delivery. This means that it may be used only during the last throes

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of labor or after the uterus is emptied. While it is true that Ergot may be used under the most favorable circumstances to increase the expulsive efforts of the uterus, yet, in most cases of labor, when it becomes necessary to stimulate the pains, Ergot is not to be compared to the use of large flannel cloths wrung out of water as hot as can be endured by the patient, and spread over the dome of the abdomen and changed every sixty seconds. This measure possesses the further advantage of keeping at least two women fully employed, and they find no time to wring their hands and ask the doctor why he don't do something for his patient.

It is quite as desirable to know when not to give a remedy as to know when to give it, and as Ergot is not without unpleasant effects if given when contra-indicated, it may not be amiss to mention some conditions which should prohibit its use.

Again, discerning empiricism confirms what might have been inferred from the known physiological action of the drug, viz.: that the pathological conditions which contra-indicate the use of Ergot are such as show already undue contraction of unstriated muscular tissue, either with the blood vessels, sphincters, or walls of hollow viscera.

When affecting the blood vessels, there will be found a diminished capillary circulation, shown by a dry, parchment-like, shrunken skin, with dry and falling hair, the scalp being covered with dandruff, and the skin also possibly showing spots of dry eczema, psoriasis, sclero-derma, or coldness. The mucous surfaces possess neither normal color nor moisture, and there is diminished secretion from glandular organs.

High blood pressure, from which may result bradycardia, and an intermittent heart action with palpitation is a condition unfavorable to the use of Ergot. As Ergot increases blood pressure, it should not be given when endo-carditis exists, or when myo-carditis or degenerative changes have weakened the heart walls. So also when the heart is contending against a contraction of the peripheral vessels, as in intestinal nephritis, arterio-sclerosis, chronic gout, many cases of rheumatism, arthritis deformans, lithemia, and most neurosial manifestations of the so-called uric acid diathesis, it should not be further taxed by the increase in blood pressure incident to the use of Ergot. Reynaud's disease, simple gangrene, diabetes mellitus, spinal anemia with neurasthenia, and cerebral anemia with melancholia and progressive dementia, contra-indicate the use of Ergot.

In giving Ergot in large doses or for long periods of time, it should not be forgotten that it may induce retention of urine by causing tetanic contraction of the sphincter vesicæ. From this it follows that Ergot should not be used if retention of urine already exists. So also strangury and the tenesmus of dysentery may bar the use of Ergot. Further contra-indications for its use are found in spasmodic stricture of the urethra, rectum or esophagus, either as a neurosis, or as a phase of hysteria; spasm of the larynx (*laryngismus stridulus*), bronchial asthma, vaginismus, and hour-glass contractions of the uterus.

SPECIFIC INDICATIONS AND USES OF ERGOT.

Ergot is valued chiefly as a parturient and anti-hemorrhagic remedy. In tedious child-birth, when labor is well advanced, the os uteri moderately dilated and there is no mechanical obstruction to labor, as pelvic deformity or exostoses, no mal-presentation, or disparity of the size of the foetal head to the parts of the mother, and the cause of delay is *uterine inertia*, Ergot may be used to facilitate labor.

Ergot is, however, chiefly valued as the agent to control hemorrhage, particularly post-partum hemorrhage. Full doses may be given. In passive hemorrhages smaller doses are effective and indicated when there is a feeble circulation. It is also of much value in disturbances of the circulation in the brain and cord centres as indicated by dizziness, partial unconsciousness, unsteady gait, and dull expressionless eyes, with pupillary immobility or dilatation. Small doses are indicated by these symptoms in the brain congestion following epilepsy, in threatened apoplexy, and in the coma following apoplectic seizures. It is a positive remedy, when indicated, for uterine subinvolution.

Dosage.—R Specific Medicine Ergot, gtt. v to 3j.

Aqua, - - - - - ̄ IV.

M. Sig.—Teaspoonful as required.

For the uses of Lloyd's Ergot, see page 8 and the therapeutical article by Dr. Conklin, pages 9 to 15.

SPECIAL.

The accompanying Treatise is a part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of *Materia Medica*, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

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LLOYD BROTHERS,

Cincinnati, Ohio.

July, 1905.

A TREATISE ON MACROTYS.

The Therapeutic Uses of Macrotys are by PROFESSOR R. C. WINTERMUTE, M. D., Cincinnati, Ohio, Professor of Obstetrics, Gynecology and Pediatrics, and Clinical Diseases of Women and Children, Eclectic Medical Institute, author of "King's Eclectic Obstetrics," (*Revised*), etc., and by PROFESSOR CHAUNCEY D. PALMER, M. D., Cincinnati, Ohio, Professor of Obstetrics and Diseases of Women in the Medical College of Ohio, author of "Dysmenorrhœa: Its Essential Nature and Treatment," etc.

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- Treatise No. I embraces *Thuja Occidentalis*.
- Treatise No. II embraces *Cactus Grandiflorus*.
- Treatise No. III embraces *Pilocarpus (Jaborandi)*.
- Treatise No. IV embraces *Veratrum Viride*.
- Treatise No. V embraces *Chionanthus Virginica*.
- Treatise No. VI embraces Asepsin and Asepsin Soap.
- Treatise No. VII embraces *Collinsonia Canadensis*.
- Treatise No. VIII embraces *Nux Vomica*.
- Treatise No. IX embraces *Gelsemium*.
- Treatise No. X embraces *Belladonna*.
- Treatise No. XI embraces *Oenanthe Crocata*, Vegetable Caustic and *Crataegus*.
- Treatise No. XII embraces *Ergot*.
- Treatise No. XIII embraces *Macrotys*.
- Treatise No. XIV will embrace *Dioscorea*.

Drug Treatise, No. XIII.

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Macrotys (Cimicifuga.)

(Black Snakeroot.)

Common Names.—Black Snakeroot, because of the color of the root, and its reputed use in snake-bite; Black Cohosh*; Rattle Weed, Rattle Root, and Rattle Snakeroot, so named because the dried spikes carrying the seed rattle in the wind. These terms are sometimes corrupted into Rattlesnake Root, and Blacksnake Root. Other common names are Bugwort and Bugbane, (borrowed from the various European species of *Cimicifuga*, that were used to drive away insects, but misapplied to the American species); Squawroot, a name belonging more properly to Blue Cohosh, because of the medicinal use of the drug by the Indians; and Richweed, given by Gronovius, 1752, because the plant frequents rich woodlands. The term Richweed is now given by botanists to *Pilea pumila*, a very different plant.

History.—*Macrotys* is abundantly distributed in rich woodlands over the greater portion of the United States east of the Mississippi River, except in New England and the extreme South. It is also found in Missouri and Arkansas.

Macrotys was observed by the earliest European travellers in America, being carried to England in 1732, and first described by Plukenet† in 1705. All pre-Linnæan writers classed the plant with *Actæa*, mostly under Tournefort's name, *Christopheriana*. Linnæus gave it the name *Actæa racemosa*, under which it was classed until Pursh referred it to the genus *Cimicifuga*. Rafinesque, 1808, by reason of the fact that the fruit of the plant does not accord with that of either *Actæa* or *Cimicifuga*, proposed the name *Macrotyris actæoides*, changing the name in 1828, to *Botrophia Serpentaria*. Eaton in the fourth edition of his Manual followed Rafinesque, calling the plant *Macrotys serpentaria*, the latter being Pursh's specific name, but incorrectly spelling the name, which should have been *Macrotyris*, instead of *Macrotys*, an error perpetrated by De Candolle, who preceded Eaton.

Pharmacopœial Names.—1820, *Cimicifuga*; 1830 (Philadelphia edition), *C. racemosa* and *C. serpentaria*; 1830 (New York edition), *Actæa racemosa* and *C. serpentaria*; 1840 to date, *C. racemosa*.

* Four native American plants were called "Cohosh." *Black Cohosh*, or *Macrotys*, *White Cohosh*, or *Actæa alba*, *Red Cohosh*, or *Actæa spicata*, var. *rubra*, and *Blue Cohosh*, or *Caulophyllum thalictroides*. The term "Cohosh" is an Indian name of unknown meaning.

† Plukenet lived when new plants were pouring to England from this country, his publications being rich in descriptions of American plants. He classed *Cimicifuga* with the *Actæa spicata* of Europe, using the old generic name "Christopheriana facie. Herba spicata, ex Provincia Florida." His inaccurate but yet sufficient drawing establishes the plant's identity. His specimen of the plant is preserved in the British Museum.

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When Eclecticism was founded, Eaton's Manual was the popular textbook on Botany, hence the early Eclectic authorities used the name *Macrotys racemosa*, which name, owing to the reluctance of this school to change established terms, has yet the preference, and is still best known in Eclectic literature.*

Medical History.—*Macrotys* was highly valued by the Indians, who employed decoctions of the drug for diseases of women, for debility, to promote perspiration, as a gargle for sore throat, and especially, for rheumatism. These uses by the Indians introduced the drug to early "Domestic" American medicine, and it was consequently given much attention by the earliest writers, e. g., Schöpf,†

*The name *Macrotys* is so firmly established in Eclectic literature that it is not advisable to attempt to change it, although in botanical works the plant has become generally known as *Cimicifuga racemosa*, in keeping with advanced views of classification. Botanists change their ideas of nomenclature so often that it is not practicable for the layman to always keep in tenor with it.

†Johann David Schöpf was born March 8, 1752, in Wunsiedel, Bavaria. At the age of eighteen he matriculated in the University of Erlangen, his teacher being Johann Christian Daniel Schreber, "the second Linnaeus," who was Professor of Medicine and Director of the Botanical Garden. He received his degree in 1773. Thence he continued his studies in the University of Berlin, and in 1774 made a lengthy tour throughout Europe, studying in the line of natural sciences. In 1777, the ruler of his country, Christian Friedrich Carl Alexander, Margrave of Ansbach, being sorely in debt, sold to England 1,255 men, his quota of the 30,000 Hessians employed to suppress the American Revolution. Schöpf volunteered as a surgeon and physician to accompany these unfortunates, and arrived in America, at Staten Island, June 4, 1777, serving through the war. At its close, in 1783, he obtained permission to remain in America to travel and study. On foot he struck into the country, through New York to Philadelphia, thence, by way of Bethlehem, into the Alleghanies, thence to Pittsburg, the Ohio River, and Kentucky, returning by way of Sheppardstown, Baltimore and Annapolis to Philadelphia. He next made a Southern tour, through Virginia, North and South Carolina to Charleston, thence to Florida, and after a stay of several weeks at St. Augustine, he went to the Bahama Islands, returning by way of Nassau, on the Island of Providence. June 4, 1784, he sailed for Europe, with his treasured collection of plants and products. Landing in England, he traversed England and France, arriving home in 1784, after an absence of almost eight years.

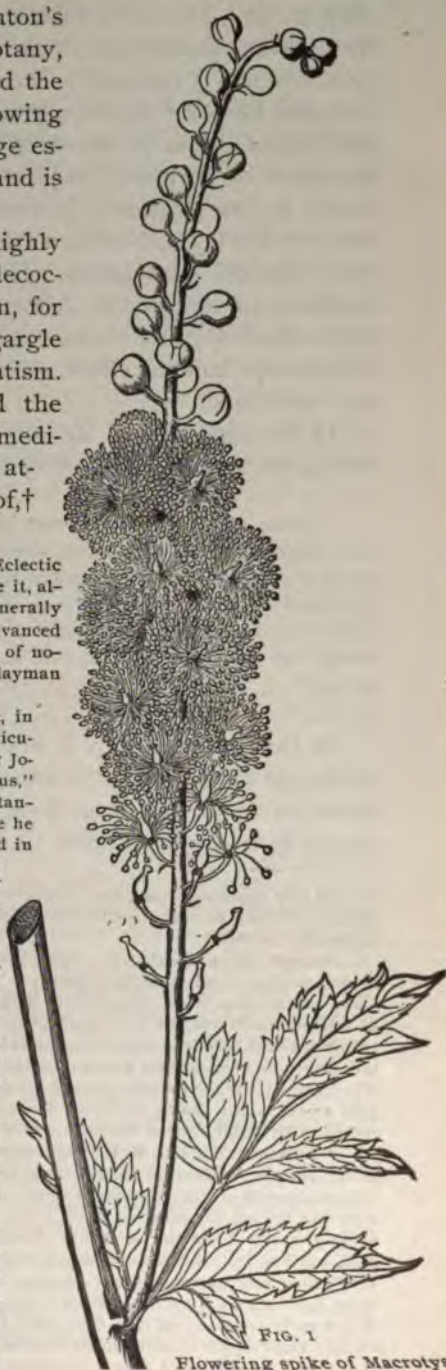


FIG. 1

Flowering spike of *Macrotys*.

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1785, Barton, 1801, Peter Smith, 1812, Bigelow, 1822, Garden,* 1823, Ewell, 1827, Rafinesque, 1828, and Tonga and Durand's addition to Edwards' and Vavasseur's *Materia Medica*, 1829. None of these authorities, however, added anything not given by the Indian, so far as the field of action of the drug is concerned, excepting, perhaps the statement of Howard,† 1832, who was an enthusiast in favor of *Macrotys* in the treatment of smallpox, a claim supported forty years after by Dr. G. H. Norris, 1872, in a paper read before the Alabama State Medical Association. He reported that during an epidemic of smallpox in Huntsville, Alabama, families using *Macrotys* as a tea were absolutely free from smallpox, and that in those same families vaccination had no effect whatever, so long as the use of *Macrotys* was continued.

In the early use of *Macrotys*, the infusion was employed, the following being Howard's (1836) method and statement concerning it:

"Infuse a handful of the roots in a quart of boiling water, and take in doses of a common-sized teacup full, three or four times a day. We are constrained, however, to notice one circumstance connected with this subject; that the effect produced upon the system by a large dose of the tincture of the rattle-root, (which is sometimes used instead of the tea), in some instances is very alarming, though we have heard of no case in which any bad consequences have followed its use."

In this connection it is interesting to note that Howard calls attention to the fact that the effect of the infusion is not marked by the alarming action of a large dose, as is the case with the tincture. The reason is evidently because the watery menstruum does not carry the

He was now appointed court and military physician, and in 1791, when Ansbach-Baireuth was ceded to Prussia, he continued to hold office under the new Government. His death occurred September 10, 1800.

Schöpfung left a number of prints, principal among which was his description of North American plants and medicines, published in Latin, under the title, "*Materia medica americana potissimum regni vegetabilis, Erlangæ; sumtibus Joh. Jac. Palmii, 1787.*" This work of Schöpfung, which was the first systematic American *Materia Medica*, is exceedingly rare. So important is it, however, and so complete in the field it occupies, that most medicinal plants mentioned by us date their first authentic mention to Schöpfung's *Materia Medica*. Reference to it is frequently made in these Drug Studies. The Lloyd Library, in 1903, reproduced this valuable work in *fac simile*, Professor Edward Kremers contributing thereto the biographical record of Dr. Schöpfung, from which this brief note is condensed.

*Alexander Garden, M. D., was a native of Scotland, educated at Edinburgh, and was for thirty years a resident of Charlestown, South Carolina. He was a correspondent of Ellis, a zealous disciple of Linnæus, and a critic of the preceding systems of botany. He took sides with the British Government during the Revolution, suffered much loss of property, and about the end of the war, with his wife and two daughters, returned to England, where he died, April 15, 1791, in the sixty-second year of his age. His son remained in South Carolina. Dr. Garden was honored by the naming of the shrub, *Gardenia Florida*, to which genera so many species have since been added. His article on *Macrotys* was one of the most complete of the early treatises on that drug, and from it, unquestionably, subsequent writers drew much of their inspiration as authoritative reference to his work as late as 1823 illustrates.

†For a biographical note concerning Dr. Howard, see Drug Treatise on *Dioscorea Villosa*.

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energetic resinous compounds that are present in such large quantities in the alcoholic liquid. This indicates the watchful care of these early investigators of botanic drugs.

Following the writers above mentioned came the Eclectic fathers, as well as the founders of the Pharmacopœia, and of the United States Dispensatory, all of whom gave to Macrotys its full credit. Among these may be mentioned Beach, Thomson, Howard (Botanic), Dunglison, Wood, Griffith, Lee and King, to the last of whom is unquestionably due the conspicuous position the drug has occupied in Eclectic medication, as well, probably, as a large share of its popularity in other directions. Professor Dunglison, 1843, placed Macrotys with the special sedatives, stating that "it unites with a tonic power, the property of stimulating secretions, particularly those of the skin, kidneys, and pulmonary mucous membrane." He records its value in rheumatism, and italicizes the statement that "the more acute the disease, the more prompt and decided will be the action of the remedy."

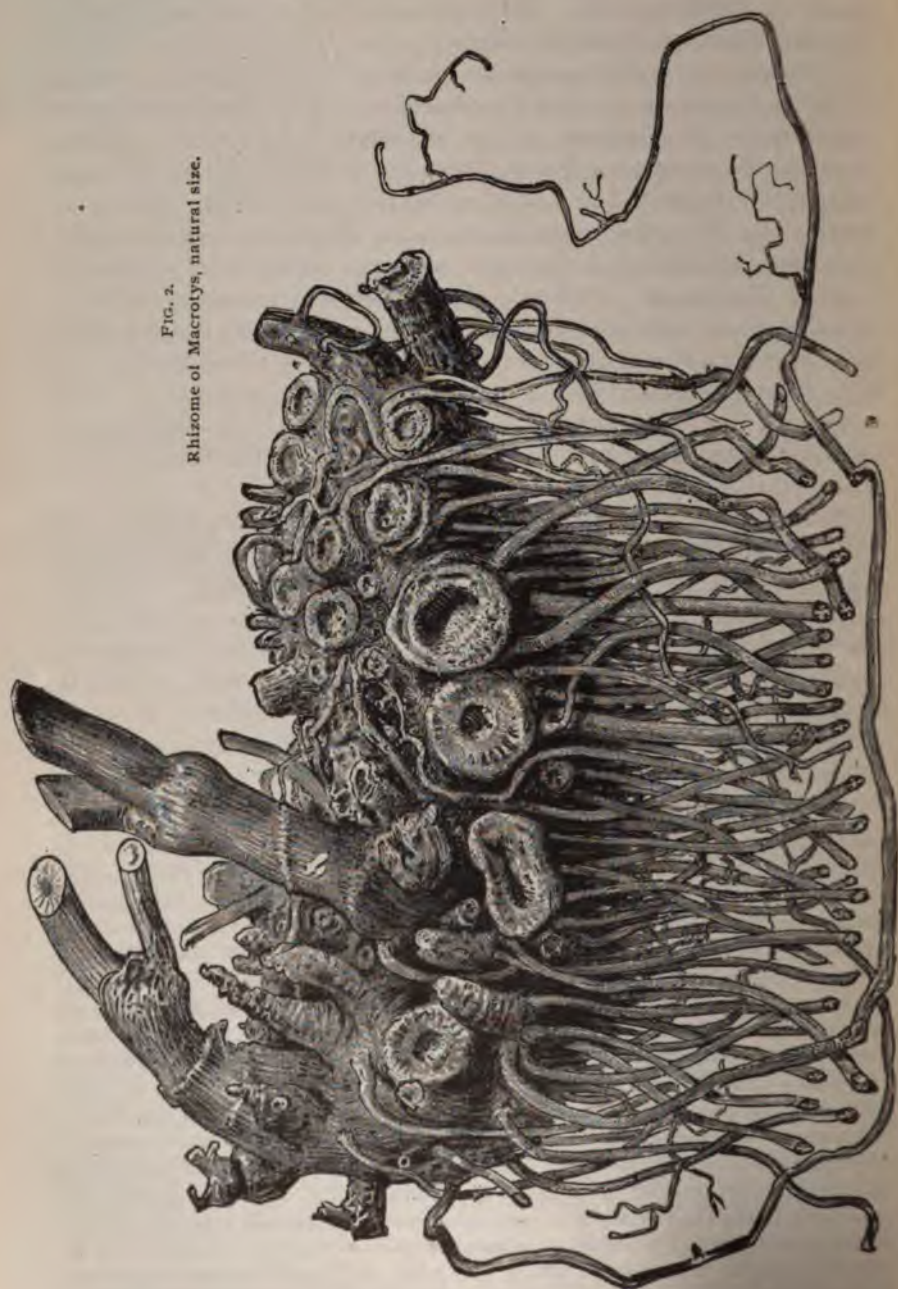
The Committee of the American Medical Association, 1848, Dr. N. S. Davis, Chairman, reported that the committee "uniformly found Macrotys to lessen the frequency and force of the pulse, to soothe pain and allay irritability." In a word, they held it to be "the most purely sedative agent we possess, producing its impression chiefly on the nervous system of organic life." (*Drugs and Medicines of North America.*)

Dr. John M. Scudder, an ardent admirer of Macrotys, writes as follows in his work, "Specific Medication:"

"Like all other direct remedies, Macrotys may be employed in any case, no matter what name the disease may have in our nosological classification, if the condition of the nervous system calls for it. The heavy, tensive, aching pains are sufficiently characteristic and need not be mistaken. So prominent is this indication for the remedy, in some cases, not rheumatic, that I give it with a certainty that the entire series of morbid processes will disappear under its use. For years I have employed Macrotys as a specific in rheumatism, and with excellent success. Not that it cures every case, for it does not; neither would we expect this, for this would be prescribing a remedy for a name. Macrotys influences the nervous system directly, relieves rheumatic pain when not the result of inflammation, and probably corrects the diseased condition (formation of lactic acid) which gives origin to the local inflammatory process. Thus in the milder cases, where the disease has not localized itself as an inflammation, Macrotys is very speedy and certain in action. Where rheumatism has localized itself in an inflammatory process, all the benefit we obtain from it is that we remove the cause, and hence the reason for a long continuance of the inflammation. It is a remedy for all pain of a rheumatic character, and for these we prescribe it with the best results. Those cases which go under the name rheumatic neuralgia are very speedily relieved by it. In some cases, the pains of weeks' duration disappear in a single day."

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FIG. 2.
Rhizome of *Macrotys*, natural size.



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Among the more recent papers on *Macrotys* may be cited the publications of Dr. Eric E. Sattler, Cincinnati; Dr. Edwin M. Hale, Chicago, and Dr. John King, Cincinnati, who contributed special papers on the subject of *Macrotys* to the publication, *Drugs and Medicines of North America*, in which work is to be found the most complete study the drug has ever received.

Description.—Fresh *Macrotys* rhizome (Fig. 2) is in matted clumps, averaging from four to eight ounces in weight, although in exceptional cases we have seen specimens weighing, when fresh, over four pounds. The rhizome is horizontal, with numerous, short, upward curved branches, which give the main rhizome a rough, irregular appearance. These branches are sometimes the remains of former leaf stems, but are generally latent, undeveloped buds. The main

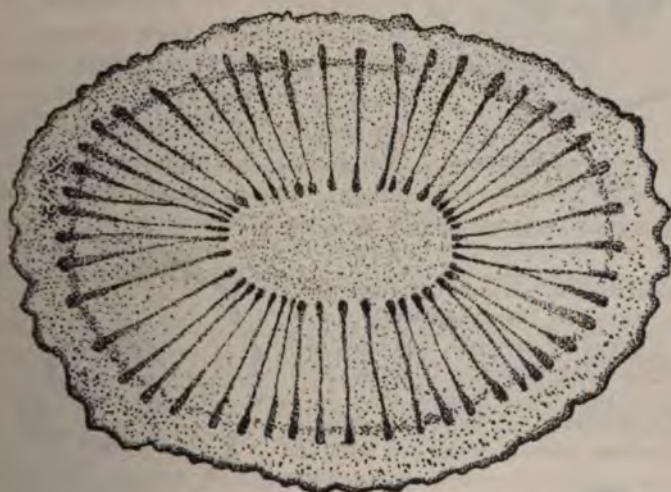


FIG. 3
Section of *Macrotys* rhizome, magnified.

rhizome and all its branches are thickly marked with large annular scars, left by the decayed bud scales. The fresh roots thickly cover the entire under part of the rhizome clump, and are from six to ten inches long. Green *Macrotys* is brittle and breaks with a smooth fracture. The freshly broken green root is white, but immediately turns pink when covered with alcohol, tinting the liquid pinkish, which, as well as the drug, finally changes to yellowish brown. The fresh rhizome, broken and exposed to the air turns dark, and ultimately black. Owing to this change in composition, the drug should never be broken before it is dried. The odor of *Macrotys* is peculiar, reminding one of smoke from smouldering twigs and leaves.

The rhizome has a central pith surrounded with a circle of con-

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centric, flat, woody rays, and is covered with a firm bark (Fig. 3), which in the fresh rhizome is very dark brown, excepting at the base of the leaf stem, which is pinkish white, as also are the young buds. The dried root is a shrunken representative of the fresh. It is dark internally, excepting the woody rays, which are lighter, and therefore prominent in cross section, resembling the spokes of a wagon



FIG. 4.
Section of fresh root of *Macrotys*,
magnified.

wheel (Fig. 4), being very different from the cross section of *Cimicifuga Americana* (Fig. 5.) These firm, woody rays do not shrink in drying like the other tissue, thus giving to the dried root an angular appearance. (Fig. 6.)

Sophistications.—No intentional sophisticants or adulterants of the crude drug have been observed by us. Large amounts of earth are often to be found in the root clumps, and occasional admixtures of foreign roots, such as *Collinsonia* and other species of *Cimicifuga*. The powdered drug is liable to

the usual adulterations found in such products.

Constituents.—*Macrotys*, like other American drugs, has been persistently and repeatedly attacked by chemists, beginning with Mears, 1827, passing thence to Tilghman, 1834; King, 1835; Davis, 1861; Conard, 1871; L. S. Beach, 1876; Trimble, 1878; Falck, 1884; Warder, 1884, and others, both contemporary with and

following those named above. All authorities subsequent to King unite in saying that the most conspicuous product of *Macrotys*'



FIG. 6.
Section of dried root of
Macrotys, magnified.

disintegration is a compound resinous body, which was first discovered by Dr. John King in 1835. Subsequent studies have been largely devoted to the splitting of this resin into by-products, none of which as nearly represent *Macrotys* as does the so-called resin, which is, in itself, a complex mixture of bodies. Some of these resinous bodies exist, possibly, in a natural condition in the drug, but the majority are

created by drying, chemistry and manipulation. In this connection let us say that so delicate is the structure of this drug, *Macrotys*, that even the touch of the atmosphere, as well as manipulation by means of solvents and subsequent dry-

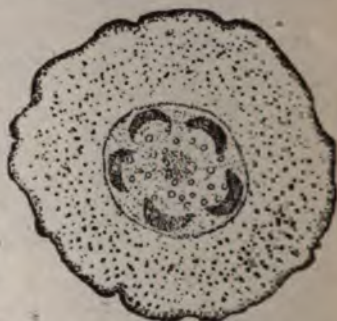


FIG. 5.
Section of *Cimicifuga Americana*,
magnified.

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ing, are sufficient to produce great changes, and result in newly constructed products. A proximate crystalline substance was announced by Conard, 1871, but all investigators subsequent to Conard failed to obtain it, owing, possibly, to differences in manipulation. Macrotys yields the usual organic and inorganic constituents of plants, such as gum, coloring matter, earthy salts, etc.

Macrotin.—This "resin" is known in unofficial pharmacy under the names *Macrotin*, *Macrotyn*, and *Cimicifugin*. It is a resinous complexity of a light yellowish color. It imparts a sweet taste to water, and darkens on drying, producing when pulverized, a brownish or yellowish powder. Upon prolonged chewing it becomes disagreeable, imparting a burning or smarting sensation to the throat. Overdoses occasion severe headache, and at the best, the resin must be cautiously administered, if ill results are to be avoided. Grover Coe, in 1856, assailed Macrotin "as not representing the plant," his opinion of over fifty years ago being now firmly established in Eclectic therapy, where the Specific Medicine Macrotys is generally employed by recognized authorities. (See "Therapeutics of Macrotys," by Professor Robert C. Wintermute, M. D., p. 10.)

PHARMACEUTICAL PREPARATIONS.

Fluid Extract.—The Pharmacopœia of the United States recognizes the Extract and Fluid Extract of Macrotys under the title *Cimicifuga*. Both these extracts are made by percolating the dry, powdered root with official alcohol, which, in our opinion, is the best menstruum that can be selected for the drug. The preparation has a very dark color, owing both to the presence of destructive tissue-compounds formed in the drug during the process of drying, and to subsequent exposure, as well as to the black coloring matter ever present in its epidermis.

Extract.—The distinction between the Fluid Extract and the Extract is principally that of concentration, the Extract being made by evaporating the Fluid Extract to a pilular consistency. It must be remarked, however, that such changes as occur from the application of heat and atmospheric exposure under different manipulations concern the Extract to its discredit.

Specific Medicine Macrotys.—This is the Eclectic preparation that for a generation has been the favorite of all the Macrotys preparations, and, it will be observed, is the one selected as the representative form of the drug by Professors Palmer and Wintermute in their contributions to the therapy of this Drug Study. It represents, minim for grain, the full value of fresh Macrotys, exclusive of its water. In other words, minim for grain, it represents the real tissue of the root. It has a golden yellow color, a slight odor, and a sweet taste, but is free from sugar. If well stoppered, it does not change by age, but preserves its qualities indefinitely. It mixes with alcohol without change, but with water it forms a milky mixture which, when Specific Medicine Macrotys is diluted with water, renders it necessary that the mixture be well shaken before each dose is taken. (See "Dispensing Difficulties.") If a few drops be added to a little alcohol tincture of iron darkens the mixture, which becomes

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black if the Specific Medicine Macrotys is in excess. It contains no inert material, no plant dirt, and, in our opinion, is a perfect Macrotys preparation, of uniform and exact value.

Dispensing Difficulties.—Specific Medicine Macrotys should be dispensed in water, but yet, when mixed with water, it produces a precipitate that is of therapeutic value. This, adhering to the bottom of the bottle, renders it necessary that it be well shaken before each dose is taken.* Ten grains of asepsin dissolved in a pint of water, to which the Specific Macrotys is added, will prevent the formation of this crusty sediment, the precipitate, if formed at all, being light and flocculent. Besides, asepsin possesses a marked value in rheumatism, as well as being useful for its antiseptic qualities, thus materially aiding the action of the remedy.

* **Suggested Prescription for Macrotys.**—*Indications.*—Muscular pains; pains increased by muscular contraction; uterine pain with sense of contraction.

Use.—For rheumatism, and for muscular pains; also a remedy for inflammation of fibrous tissues. To relieve after pains, false pains during labor, and in uterine rheumatism.

Dose.—℞.—Specific Medicine Macrotys, 3s to 3ij.

Water, ℥iv.

Asepsin, grs. iij.

M. Sig.—A teaspoonful of the dilution every one or two hours. (Usually Aconite or Veratrum is added.)

THERAPEUTICS OF MACROTYS.

By PROFESSOR ROBERT C. WINTERMUTE, M. D., Cincinnati, Ohio.

Macrotys is one of the best known of our Specific Medicines, and, no doubt, is as generally used with as satisfactory results by Eclectic physicians as any of the long list of valuable agents peculiar to the school.

It would probably be impossible to find a physician familiar with Specific Medicines who would not include Macrotys as one of the essentials, were he restricted to the use of a half-dozen remedies.

Our first knowledge of Macrotys was as a boy at home, going in the fall of the year to the woods, and grubbing up what we then knew as Rattle Root. This was mixed in small quantities with the feed of the horses for the purpose of preventing distemper and kindred diseases, the belief prevailing that it was a valuable prophylactic and results seemed to justify the presumption.

Later, a short distance from our first location in the practice of

* Tablets and pills made of Macrotys or other drugs containing resins and such insoluble substances as agglutinate, are liable to either pass unchanged through the alimentary canal, or to produce more or less severe local irritations.

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medicine, there lived an elderly "country squire" who dispensed a remedy that possessed remarkable virtue in the treatment of rheumatism; he could often relieve, and frequently cure cases, after physicians had apparently failed. His successes attracted chronic sufferers from both far and near, and while he willingly supplied his medicine at reasonable rates to all who applied, and free to those not able to pay, no amount of persuasion could induce him to reveal its composition. He guarded his secret greedily until attacked by what proved to be his last illness. We were called to attend him, and on the occasion of one of our daily visits, he made known his intention of giving the world, through us, his famous medicine. We were not a little surprised to learn it was something we were already using,—Macrotys; for, in his words, it was "a bitters of rattle root and whisky."

Macrotys is a remedy of great usefulness in three departments of medicine, viz.: general practice, gynæcological diseases and obstetrics. The specific indications are muscular pains, soreness and aching of the muscles, pain increased on motion or contraction of the muscles; in the long muscles a bruised, tired or fatigued sensation in the belly of the same; pain not constant, but intermittent, tensive, and frequently in waves; pain affected but little by pressure or palpitation; temperature increased but slightly, if at all; circulation free; skin hot, but inclined to moisture.

Thus Macrotys is called for in the treatment of numerous diseases, since at some point in their course prominent symptoms are noted, corresponding with the indications for this remedy.

Specific Medicine Macrotys may be prescribed in dilution, as follows: Specific Medicine Macrotys, x gtt. to 1 dr., water iv ozs., teaspoonful every one to three hours. It is indicated for all pains of a rheumatic character, as well as in those cases so frequently encountered, which are recognized as rheumatic neuralgia. In these, we may be assured of very speedy relief. It possesses no equal in the treatment of lumbago, especially if it be associated with bryonic. The intensity of the suffering readily yields. Associated with other specifically indicated remedies, it is an important factor in the treatment of a majority of the cases of lagrippe, the sore and aching body and extremities being the immediate indication; likewise the same indication calls for Macrotys in the early development of smallpox, and if given with the first appearance of the characteristic "bone-aches," it will undoubtedly render the disease milder.

In chorea, especially following an attack of rheumatism, or in a rheumatic subject, it is highly extolled, clearly evidencing its marked influence over the nervous system. Cardiac rheumatism, transient rheumatoid pa ff neck, eye-strain with pain, dull throbbing or

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aching in the prostate, in most instances yield quickly and substantially to this agent.

In fact, at any and all times where a pathological condition exhibits symptoms corresponding to the foregoing indications, regardless of nosological classification, Macrotys is the remedy,—basing our judgment on specific diagnosis, pathological expression, never on names of diseases. Macrotys has a wide range of usefulness in the practice of gynæcology; its influence in various menstrual disturbances and consequent neuroses is especially marked, relieving irritation, atony of the reproductive tract, irregular enervation, and strengthening normal functional activity. This is particularly true in dysmenorrhœa of the neuralgic type, in which it is surpassed by no other drug. One or two days before each period, the patient is nervous and irritable, pain in the region of the uterus, radiating to the tubes and the ovaries, tenesmus and weight attended by lumbosacral pain, the suffering being gradually modified as the flow becomes established. Macrotys will likewise bring relief, in some instances, to the sufferer from inflammatory dysmenorrhœa; given the case with scanty flow, heavy, dragging, uneasy sensations in the fundus and subpubic regions; dull aching pains with wave-like recurrence, despondency and evidence of hysteria, best describes the condition.

Macrotys often serves a good purpose in amenorrhœa, other remedies as they are indicated being given in conjunction. Think of Macrotys in those cases of *suppressio mensium* resulting from colds, or emotional causes, attended by bearing down, expulsive effort, pain in the back, radiating to the uterus, ovaries and upper thigh; also in *Emanatio Mensium*, where the various symptoms of menstruation (barring the flow) appear at regular intervals, the trouble not depending on so-called tardy menstruation, or anæmia, Macrotys will prove efficient and usually act promptly, imparting tone and overcoming deficient nervous energy. In either event we may prescribe $\frac{1}{2}$ to 1 drachm Specific Medicine Macrotys to 4 ozs. of water, teaspoonful doses of the dilution every three hours, anticipating the usual time for the period by three or four days, and continuing in this manner until the normal function is restored or established.

In these, and in cases of scanty or retarded flow, as well as many that are apparently dependent on want of vitality of the uterus and adnexia, Macrotys acts through the hypogastric plexus directly on the great sympathetic, stimulating increased impulses to the ovaries and tubes, and strengthening menstrual rhythm. After the same manner, good results have followed its continued administration in some cases of sterility, as well as in so-called frigidity of the female.

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In our observation, no medicine equals Macrotys in reflex or uterine headaches, characterized by a dull aching, sometimes quite severe, on top of the head; this is frequently present during early pregnancy, or may result as a consequence of perverted uterine function. Ovarian pains, the result of exposure to cold, neuralgia, or hyperæmia, as well as sensitiveness and pain along the course of the tubes attendant upon salpyngitis, all yield promptly to Macrotys, either singly or in combination with the specially indicated sedative. Likewise its indications are usually clearly in evidence in the various ills incident to the menopause, and if carefully followed will be found, with other means, a valuable aid in carrying the female over this critical period. Macrotys is one of the agents always included among the half-dozen remedies of the obstetric medicine case.

No other medicine will compare with Macrotys as a *partus preparator*. Given either alone and direct, or in the form of Parturient Balm (Mother's Cordial), of which it is an essential ingredient, during the last six or seven weeks of gestation, it relieves many of the unpleasant features, and, at the time of parturition, facilitates relaxation and dilatation; strengthens the contractions, and under ordinary circumstances shortens labor. It is also equally valuable as a *partus accelerator*, and may be used, when indicated, to increase the force and frequency of the pains. It is efficient and satisfactory in the relief of false pains, that frequently occur during the late weeks of pregnancy, to the great discomfort of the patient. After-pains are quite unusual following a labor in which Macrotys has been used, since the reduction and contraction of the uterus is so uniform and complete, that all secundal fragments are removed.

In suppression of the lochia from cold, or, in fact, from any cause, Specific Macrotys will prove most salutary. Macrotys will be found the most excellent agent at our command to combat the various complications and annoying symptoms that frequently follow parturition, and harass the lying-in patient, and it may be prescribed when indicated, with the most positive assurance of satisfactory results, aiding an uneventful and natural puerperium, as well as sustaining and favoring the process of normal involution.

[The foregoing elaborate presentation by Professor Wintermute, of the field of action and influence of Macrotys, in a therapeutical sense is admirably instructive and comprehensive, as the readers of this drug study will appreciably testify. We take pleasure in following it with the succinct uses of the Specific Medicine in the hands of Professor Chauncey D. Palmer, M. D., a great admirer of this preparation of the drug. As is well known, Professor Palmer has extended opportunities in the field Macrotys occupies.]

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THERAPEUTICS OF MACROTYS (*Cimicifuga*).

By PROFESSOR CHAUNCEY D. PALMER, M. D., Cincinnati, Ohio.

Cimicifuga (*Macrotys*) is a most valuable remedy in gynecological practice. Especially do I think well of it in the management of dysmenorrhœa. I give ten drops of the Specific Medicine, undiluted, three times a day, during the whole of the menstrual interval, and the same dose every one, two, or three hours, during the menstrual time, according to severity of pain. It does best when the menstrual flow is scant and insufficient, and probably, also, in cases more or less rheumatic in tendency. For the neuralgic or rheumatic form, and for the congestive form, it is quite reliable.

Therapeutic uses of *Macrotys* from the writings of physicians who employ it.

Specific Medicine *Macrotys* (Black Cohosh).—This is the remedy for muscular rheumatism, not the result of local inflammation. It is also one of our most reliable female remedies.

Scudder says, associated with *pulsatilla*, it is a specific in many cases of dysmenorrhœa. It should be given three or four days before the expected period, and continued until the flow is free. In amenorrhœa it is also one of our most efficient agents. In rheumatism of the uterus, to relieve false pains, or the many unpleasant sensations attending pregnancy, it has no equal in the *materia medica*, and becomes a true *partus preparator*.

Bartholow says there is little doubt that it increases the contractility of unstriped muscular fiber in a manner similar to ergot, but much feebler. It stimulates the venereal appetite in man, and promotes the menstrual flow in woman.

In a practice of more than twenty years, following the indications for the use of *Macrotys*, I have never been disappointed. In treating cases of threatened abortion, before the membranes are ruptured, alternated with specific viburnum, I have not had a failure. I have used *Macrotys* in cases of false pains that sometimes come on a few weeks before the time for true labor with unvariable success.

For the pains and unpleasant sensations that occur during the last months of gestation, give five drops, three or four times daily. It will give great relief, and your patient will bless you when she comes to her confinement. I would say to the young doctor, give this remedy a thorough study, and a fair trial, and it may be that a wider range of usefulness may be found for it than we now have any knowledge of.—*Wm. A. Iles, M. D., Urbana, Kan., Medical Brief, June, 1905.*

***Macrotys*.**—This is the remedy for rheumatism, muscular pains, and also as a parturient and uterine tonic. In rheumatism it is used when the pains are mostly muscular; the flesh is sore and feels as though it were bruised. In lumbago, in combination with specific hydrangea and acetate of potash, it can not be excelled. In rheumatism and muscular pains we prescribe Specific *Macrotys*, dr. 2; water, f ̄ 4, teaspoonful every four hours. As a parturient or emmenagogue, it is used when the patient complains of pain and tenderness in the uterus and backache.

It is also used to excite uterine contractions and is often prescribed as a tonic, preparatory to labor. The dose in this case is smaller, 20 or 30 drops of Specific

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Macrotys, water $\text{f } 4\overline{5}$. We have found that if given in larger doses, or given too frequently, in some patients it produces headache.—*Eclectic Medical Journal*, Vol. xi, No. 4, W. N. Mundy, M. D.

Specific Macrotys.—*Indications.*—Muscular soreness, especially in fleshy part of the muscle, severe pain in the scalp, severe pain in the forehead, a sensation as if the top of the head would fly off, brain feels oppressed, pain at the base of the skull as if it were being pierced, stinging pains in the eyeballs and eyelids; Macrotys pains are generally in waves, patient sad and gloomy, feels as if he would go crazy, sleeplessness, nervousness, fluent watery discharge from nostrils, increased secretion of tears, frequent sneezing, soreness and roughness in the throat, cough caused by tickling in the throat, difficult swallowing. The dose of Specific Macrotys is from twenty to thirty drops in four ounces of water. A teaspoonful every hour or two hours.—C. W. Eckermeyer, M. D., Montgomery, Ohio, National Eclectic Medical Association, 1902.

Indications for Macrotys.—This remedy has a wide range as a pain reliever. It is indicated by muscular aching, local and general; aching pain as from overwork, overstrained muscles, great muscular aching, with chilliness and rapidly increasing temperature. The indications for its use are present in the forming stages of many acute fevers. Macrotys is indicated in acute muscular rheumatism, rheumatic fever, acute cardiac rheumatism. In chronic cases of cardiac rheumatism, it does not appear to have much influence. In congestive conditions of the uterus and appendages, with pain resembling rheumatism, it is one of the best remedies in the *materia medica*. There are many more painful conditions in which the indications for it are present, and where good results are obtained from its use.—T. D. Hollingsworth, M. D., *Chicago Medical Times*, Vol. xxxiv, No. 5.

Macrotys.—A physician in a neighboring town consulted me in regard to treatment of his wife, who was in the second month of pregnancy, and suffered from a severe and almost unbearable headache, which affected only the top of her head and was constant.

My friend had tried everything he could think of to relieve it, from chloral hydrate to morphine, and only succeeded in giving temporary relief by giving antikapnia.

I wrote a prescription containing:

℞ Specific Medicine Macrotys, $\overline{3j}$.

Simple syr., $\overline{3j}$.

Aq. Menth. P., $\overline{3ss}$.

Aqua q. s., $\overline{3iv}$.

Sig.— $\overline{ji}$ every two hours.

After taking the second dose the headache left and did not return, though I had been particular to instruct that the whole prescription be taken, regardless of the result obtained.

In the cases of headache accompanying menstruation I have given Macrotys with success.—*Chicago Medical Times*, March, 1898, B. B. Masten, M. D.

SPECIFIC INDICATIONS AND USES.

Specific Medicine Macrotys is the remedy first thought of in rheumatism and rheumatic neuralgia. It is the remedy for unpleasant sensations in the pregnant uterus; for false pains, and to aid true ones. It is undoubtedly a *parvus preparator* whenever the woman is troubled with unpleasant sensations.

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in the last months of pregnancy. It is also a valuable remedy to correct the wrongs of menstruation, relieving pain, and looking toward normal functional activity.

Macrotys influences directly the reproductive organs. This influence seems to be wholly upon the nervous system, relieving irritation, irregular innervation, and strengthening normal functional activity. For this purpose it is unsurpassed by any agent of our *materia medica*, and is very largely used.

It is the most prominent remedy for painful conditions with muscular soreness and tension.

Dosage.—℞. Macrotys, 3s to 3ij.
Water, ℥iv.

M.—A teaspoonful of the dilution every one or two hours. (Usually Aconite or Veratrum is added.)

SPECIAL.

The accompanying Treatise is a part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of *Materia Medica*, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressly for these fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional. The history, description, pharmacy and chemistry will be written by John Uri Lloyd.

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LLOYD BROTHERS,

CINCINNATI, OHIO.

August, 1905.

A TREATISE
ON
DIOSCOREA
AND
SULPHUROUS ACID.

The Therapeutic Uses of Dioscorea are written for this study by JOHN WM. FYFE, M. D.

The Therapeutic Uses of Sulphurous Acid are from the writings of JOHN M. SCUDDER, M. D., and HARVEY WICKES FELTER, M. D.

Illustrations Nos. 1 and 2 are from the American Dispensatory.

The Description, History, Chemistry, and Pharmaceutical Record of both Dioscorea and Sulphurous Acid are by JOHN URI LLOYD.

- Treatise No. I embraces *Thuja Occidentalis*.
Treatise No. II embraces *Cactus Grandiflorus*.
Treatise No. III embraces *Pilocarpus (Jaborandi)*.
Treatise No. IV embraces *Veratrum Viride*.
Treatise No. V embraces *Chionanthus Virginica*.
Treatise No. VI embraces *Asepsin* and *Asepsin Soap*.
Treatise No. VII embraces *Collinsonia Canadensis*.
Treatise No. VIII embraces *Nux Vomica*.
Treatise No. IX embraces *Gelsemium*.
Treatise No. X embraces *Belladonna*.
Treatise No. XI embraces *Oenanthe Crocata*, *Vegetable Caustic* and *Crataegus*.
Treatise No. XII embraces *Ergot*.
Treatise No. XIII embraces *Macrotys*.
Treatise No. XIV embraces *Dioscorea* and *Sulphurous Acid*.
Treatise No. XV will embrace *Development of the Pharmaceutical Still*.

Drug Treatise, No. XIV.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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DIOSCOREA.

Part Used.—The rhizome of *Dioscorea villosa*.

Common Names.—Yam Root, incorrect, because the term "*Yam*" is derived from the vine, which resembles the vine of the Sweet Potato often called Yam; Wild Yam, from the vine; Colic Root, because of its use in that ailment; China Root, a term employed by Howard, derivation unknown.

History.—"At the battle of Trenton in December, 1776, General Washington captured a large number of Hessian prisoners. Among them was a botanic physician, a Dr. Bone, who subsequently settled in New Jersey, a few miles above the city of Newark. To him belongs the credit of first using the *Dioscorea villosa* as a medicine. He appears to have used it for a long time as a secret remedy for bilious colic, and from his success in the administration of the medicine in this disease, he named it colic root. He gave to the patient half a tea-cup full of the decoction, every half-hour; the second dose rarely failed of curing this truly formidable disease."

The above from the transactions of the Eclectic Medical Society of New York State, 1870, by Dr. D. E. Smith, of Brooklyn, is part of the most complete paper on *Dioscorea* to that date. Just where Dr. Smith obtained his reference to Dr. Bone we have been unable to find. The qualities of this drug were first authoritatively recorded in a book devoted to *materia medica*, by Horton Howard.*

*Horton Howard was born in North Carolina of a wealthy slave-holding family, but being opposed to slavery he emigrated to the Ohio Territory where he thereafter lived. Until a late period in life he favored the Regular School of medicine. Owing to an epidemic of fever in 1825, that swept off many of his acquaintances, and members of his family, concerning which he states that "amongst whom I lost a lovely daughter, whose death, I have no doubt, was accelerated by bleedings," he became an antagonist to the medical methods of that date. He then studied the treatment employed by the Botanic physicians, usually styled "steam" or "patent" doctors, against whom he was much prejudiced. A case came before him in which a friend, very ill, "to his utter astonishment and indescribable horror" employed a "steam" doctor, to which Howard adds, "on seeing this, I turned upon my heel with the most disdainful and disgusting emotions, with the intention of immediately leaving the house, and the sick man to perish, as I supposed he probably would, in the hands of this adventurous empiric of the botanical school." He continues, "After reluctantly awaiting the end of the process, I again examined him, and felt myself astonished and confounded at the extraordinary effects that had been produced in so short a time. The fever was gone, the pain in his side was almost removed, the difficulty of breathing had ceased, the headache had departed, and his appetite for food returned. I was overwhelmed with reflections on my own want of liberality and consistency. I came to the conclusion that it was my duty as a man and a Christian to forego all my prejudices, and avail myself of the knowledge of these botanic medicines for the benefit of my own family."

We next find Dr. Howard "reluctantly," as he states, "the official agent of Samuel Thomson," and next we find Thomson and Howard jealous antagonists. The acrimonious discussions in *The Eclectic Medical Botanist*, Howard's friend, and *The Thomsonian Recorder*,

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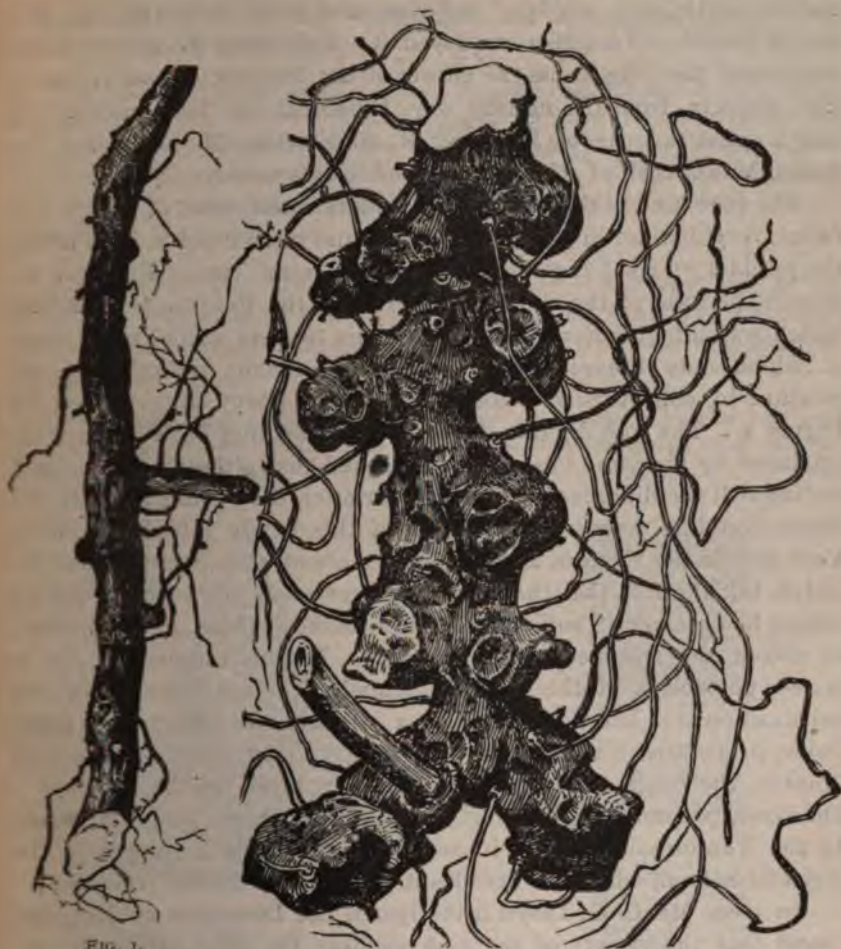


FIG. 1.
Rhizome of *Dioscorea Villosa*, typical form.

FIG. 2.
Rhizome of *Dioscorea Villosa*, "false" variety.

1836, in the third (revised) edition of his "Improved System of Botanic Medicine," no mention having been made of it in the preceding editions of the work. The drug had been brought to Howard's at-

Thomson's champion, are very curious records. Then it was that Howard issued (1832), as a rival publication to Thomson's work, his own book, "Howard's Botanic Medicine," (3,000 copies) acknowledging therein the great help of Dr. William Hance in the authorship, and also acknowledging his own indebtedness to Indian and domestic medicine. The second edition (4,000 copies) appeared in 1833. The third edition (1836) which contained the first authentic reference to *Dioscorea*, was also issued by Dr. Hance.

Dr. Howard was noted for his persevering, untiring industry. He was instrumental in advancing the settlement of a large district in the Eastern part of Ohio, encouraging emigration; and devoting himself to the interests of the immigrants. He was long Receiver of Public Money in the Land Office of the Delaware Land District, filling the office with the "atmost

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tention by Dr. J. L. Riddell,* the statement being made that Dr. Miller, of Neville, Ohio, also employed it. Following Howard's introduction of the drug, came the efforts of the Eclectic School in medicine wherein, from the earliest day, Dioscorea has been valued. It was a great favorite of Professor R. S. Newton, M. D., and I. G. Jones, M. D., both of whom prescribed it extensively.

The part used is the rhizome, or underground stem, of which two forms, very distinct in appearance, are found in commerce, both being the product of what botanists consider the same vine. Figure 1 indicates the form of the rhizome preferred in the Eclectic School, and which was altogether used by physicians of this school until 1850, at which date Botanic druggists and physicians noticed the admixture by collectors of a tortuous, chubby, heavy drug, shown by Figure 2. The root diggers, however, insisted that both drugs were produced by the same vine. They claimed that although they could distinguish the difference in the two varieties, they could not put the distinction into words. Shipments of this newly introduced Wild Yam sent to the Eastern Botanic houses about 1860, were at first rejected, but the fact that the form previously employed could no longer be obtained in sufficient amount, induced them, under protest, to accept the so-called "false" variety. In this connection, be it stated, physicians of the Eclectic School, although unaware of the substitution that had become a factor in commerce, rejected as unreliable, preparations made from the knotty drug (Fig. 2). In our opinion, the original variety should be employed in the making of Dioscorea preparations.† Thus, although Dioscorea was introduced by the Thomsonian School in medicine, it became a favorite in the Eclectic School, where for decades it has found a cordial reception.

In 1880, Mr. C. G. Lloyd investigated the Dioscorea subject, and found that the variety of the vine yielding the drug originally employed in medicine was pubescent on the under surface of the leaf, whereas the leaf of the vine yielding the knotty rhizome was entirely glabrous. It may be added that Linnæus' description of *Dioscorea villosa* indicates that the typical form he possessed was of the pu-

correctness, fidelity and punctuality." He was a minister in the Society of Friends, maintaining his religion in his every-day life before the world. He died of cholera at his residence in Columbus, September 14, 1833, in the sixty-fourth year of his age. A fund of interesting information concerning medicine and medical methods of the day of Howard is to be found in the *Columbus Eclectic and Medical Botanist*, 1832-3.

*Dr. J. L. Riddell was Professor of Chemistry in the "Worthington Infirmary" (or college), Worthington, Ohio. He resigned in 1832 or 1833, and later took the chair of chemistry-University of Louisiana. Be it known that the "Worthington College" was the forerunner of the Eclectic Medical Institute, Cincinnati, Ohio.

†See our remarks, "Supplement to the American Dispensatory," King & Lloyd, 1880, and same work, Felter & Lloyd, Vol. 1, pages 659, 660, 1898.

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ent variety. In this connection the accompanying note by C. G. Lloyd is of interest:

Works upon botany recognize only *Dioscorea villosa*, but it has become necessary to classify the two rhizomata of commerce. Considerable attention has been given to the plants, and, without an exception, the form of rhizoma was indicated by the pubescence of the under surface of the leaf. I am, therefore, led to the foregoing distinctions until a better explanation is given."—*Supplement to Am. Disp.*, 1880.

Description.—The description given in the Supplement to the American Dispensatory (King and Lloyd, 1880,) cannot be improved at this writing, and needs no correction, hence we reproduce it, verbatim, as follows:

The rhizome of *Dioscorea villosa* appears in market in slender contorted tubers, from one-fourth of an inch to half an inch in diameter, and often two feet in length. It is oval, being flattened above and below as it creeps in a horizontal



FIG. 3.
Transverse section of a small
rhizoma, magnified.



FIG. 4.
Longitudinal section of rhizoma,
from epidermis to
center, inclusive.
Magnified.

grows beneath the surface of the ground. It seldom throws out branches, but, occasionally, little protuberances project from its sides, being from one-eighth of an inch to an inch in length, and about one-third as large in diameter as the primary rhizome. They are rounding at the extremity, and seem to indicate an abortive attempt of the rhizome to throw out branches; but they do not send up the

stems. Along the upper side of the rhizome are stem-scars, which are about three inches apart. The epidermis is brown, thin, and scales off, more or less, upon drying, especially when the rhizome is gathered in the spring, but is not the case with a good quality of it, when dug in autumn. The interior of the dry rhizome is whitish, or slightly straw-colored, when gathered in autumn, but it is often brown when collected early in the season; there is no odor to it. Under a magnifying glass the texture of a broken rhizome appears spongy and perforated with numerous woody bundles. (See Figures 3 and 4). Attached to the lower part of the rhizome, an abundance of strong, wiry-like fibers

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will be observed. *Dioscorea villosa* has one of the firmest of rhizomæ, it being very difficult to powder or crush. It has no odor, and but little taste beyond a slight acidity after prolonged chewing. The so-called *dioscorein* is not a definite principle of the rhizoma, but is simply a dried solid extract, and to call it otherwise is a misnomer.

Dioscorea Villosa.—*Var. glabra.* *Description.* The rhizoma of this plant resembles that of *Collinsonia Canadensis* more nearly than it does the true *D. villosa*. It is found as a rough clump of a pound or more in weight when fresh, thickly-branched, each branch shooting from the side of the main rhizoma at an angle inclining backward and upward. The branches almost touch each other, are as large as the rhizoma, and are from one inch to three inches in length. Along their upper surface are numerous cup-shaped stem-scars, which are about one-fourth of an inch or one-third of an inch in diameter, and so thickly inserted as to intrude upon each other.† The diameter of the rhizoma and of the ramifications is from half an inch to three-fourths of an inch, and the length seldom more than six inches. Internally, the rhizoma resembles that of the true wild yam, while the lower portion is, in like manner, covered with stout fibrous rootlets. The color is generally a very much darker brown."

The dried drug is very hard, being almost as difficult to powder as *Collinsonia*. It is equally as difficult to extract by either percolation or maceration, and it is safe to say that much of the drug manipulated is only partially abstracted. The note concerning *Collinsonia* applies equally to *Dioscorea*.

Constituents.—Excepting saponin, obtained in 1885 by Mr. W. C. Kälteyer, there are no representative educts or products of *Dioscorea*, of a definite chemical structure. The drug has been attacked by enthusiasts in destructive chemistry, but the ultimates of their antagonistic processes are of no value whatever in therapy. In the early days of Eclecticism, close following the discovery of Resin of *Podophyllum* by Dr. King, attempts were made to obtain, by a similar process, an energetic principle from *Dioscorea*. The product was called *Dioscorein*, and on faith was accepted for a considerable time in the alkaloidal-resinoid-concentration craze of Eclecticism, as a worthy companion of King's energetic Resin of *Podophyllum*. It was a very inferior saponin and naturally did not stand the test of time. Then the dried and powdered solid extract was labeled "*Dioscorein*," and as such masqueraded thereafter before the profession. Finally, we find it ignominiously dismissed by Dr. King, in 1880 (*Am. Disp.*), in the following brief manner:

"The so-called *Dioscorein* is not a definite principle of the rhizoma, but is simply a dried solid extract, and to call it otherwise is a misnomer."‡

See remarks under *Collinsonia*.

† The vine of the true *Dioscorea villosa*, upon the contrary, springs from the main rhizome.

‡ For thirty years we have protested against this 'resinoid' imposition, and have aimed to teach that for decades these so called "Resinoids" had no standing in Eclecticism.

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Pharmaceutical Preparations.—There has never been any pharmaceutical preparation whatever of Dioscorea recognized in the Pharmacopœia of the United States, or the Dispensatories or Materia Medica connected with the Regular School of Medicine. In the early days of Eclectic medicine, decoctions of the drug were used, large doses being often repeated. Prof. or King administered from two to even eight fluid ounces at a dose, repeated every half-hour or hour, until relief was obtained. This heroic procedure is possible with the decoction, which largely excludes the acrid saponin-bearing compound found in the Fluid Extract and Tincture, and this fact must be borne in mind by physicians prescribing the harsh alcoholic preparations. The preparation employed in Eclectic medicine since the appearance of "Scudder's Specific Medication" is the Specific Medicine, which may be described as follows:

Specific Medicine Dioscorea.—This has a yellowish-brown color, due to the coloring matter of the epidermis of the drug; and a slightly acrid taste, due to touches of the saponin-like compound present in it. Its odor is scarcely perceptible. It mixes nearly clear with alcohol, water, syrup, and glycerin, as well as with all neutral, water-miscible liquids. The water dilution of the Specific Medicine, by standing, deposits a small amount of a flocculent precipitate, mainly saponin compounds, thrown down by the water. The white precipitate, mainly saponin, so prone to form in commercial liquid preparations of Dioscorea is absent from the Specific Medicine, which in its present perfected condition keeps unchanged indefinitely. The dirty-brown precipitates observed in ordinary Fluid Extracts are due to impurities and never occur in the Specific Medicine. Water-diluted Specific Medicine Dioscorea has a pleasant, sweetish odor, and in very small amount indeed, gives a copious reaction with Fehling's Solution a single drop giving a distinct reaction. We consider the Specific Medicine the most desirable, as well as the typical representative of the Dioscorea preparations.

THE THERAPEUTICS OF DIOSCOREA.

By JOHN WM. FYFE, M. D., Saugatuck, Conn.

Dioscorea has long been regarded as a medicament of wonderful power in the treatment of colic, but many physicians have seen cases of this abnormal condition in which the drug exerted but little, if any, curative influence. There surely must be some good reason for this lack of uniformity of action of the remedy, and it may be possible that the difference in effect is owing to failure on the part of

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the doctor employing the agent to closely observe and correctly understand the disease expressions presented in the cases in which it failed to improve the condition of the patient. He may have prescribed for the *name* colic, instead of the wrong which actually existed as the cause of the colic. In colic, as in diarrhoea, the indications for the remedies are not always the same, any more than the causes are always the same. Unless a medicine is clearly indicated we should not expect curative results from its exhibition, but a remedy which will once remove a wrong of life will always remove the same pathological condition under *exactly* the same circumstances. When we have once learned this we have learned it for all time. If it is true to-day it will be true in the years to come. A drug, however, which will cure a disease caused by atony can not be expected to remove a wrong caused by excitation. In referring to the action of Dioscorea in colic, Dr. G. M. Aylsworth in substance says:

"Gould defines colic as 'spasmodic pain in the abdomen.' Intestinal colic is due to irregular and violent contractions of the muscles of the bowels. Byron Robinson says these contractions are controlled by Auerbach's ganglia through the plexus mesentericus. C. J. B. Williams says disease consists of excess, defect, or perversion of normal life, necessitating, according to Scudder, sedation, stimulation, or alteration for cure.

"Intestinal colic, then, is either perversion due to excess, or perversion due to defect in the nervous energy generated in Auerbach's ganglia. Experience has shown that medicines making directly for the correction of these two distinct conditions are by far the most successful in the treatment of intestinal colic. Dioscorea meets an excited or excessive nerve force and directly sedates it to the normal, the large dose being useful to quickly produce the effect.

"Small doses of colocynth meet a defect in nerve force and stimulate it to the normal. The dose must be very small, for in large doses colocynth will produce colic.

"In these instances colocynth and Dioscorea are *directly* curative, morphine is not. Morphine only reaches the condition to afford relief by paralyzing sensation, which is a function of the cerebro-spinal nervous system. This means that the force from Auerbach's ganglia may still be acting abnormally, but owing to the paralysis of sensation due to the morphine the brain is unable to impress the condition on the patient's consciousness. This is almost an exact parallel to the use of chloroform in labor, where painful uterine contractions continue to the end of accouchement, but the patient

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does not know it because the chloroform does not permit the nerves of sensation to perform their duty."

The credit of first using Dioscorea in colic belongs to Dr. Bone, who resided in New Jersey in the latter part of the eighteenth century. He employed a decoction of the root, and gave one-half teacupful of it every half hour. A second or third dose seldom failed to relieve the patient of his sufferings. It was from this physician that Dr. Wooster Beach obtained his knowledge of the medicinal properties of this now well-known remedy.

I was recently called to a man who was suffering from intense pain in the lower part of the abdomen. He also had what he described as a "twisting pain," extending along the region of the ascending colon. He informed me that he had often been similarly afflicted, and that anodynes, taken frequently, afforded only partial relief. The patient was immediately given twenty drops of Specific Medicine Dioscorea in one-half teacupful of *very hot* water, the dose being repeated in fifteen minutes. The medicine acted very promptly, and the man was soon resting comfortably in bed. I then prescribed as follows:

R	Specific Medicine Dioscorea,	- - -	gtt. xxx.
	Water,	- - -	$\frac{3}{4}$ iv.
M.	Sig.—Teaspoonful every half hour.		

No other medicine was administered, and the patient made a complete recovery.

Dr. D. E. Smith, of Brooklyn, N. Y., for many years used Dioscorea with marked success. He employed it in all cases of colic, whether bilious or flatulent. He also deemed it efficient in the severe cutting pains which often occur in dysentery, and in the dull, heavy pains in the stomach and bowels which are sometimes produced by indigestion. In one of his cases the patient had suffered for years from almost constant pain in the stomach and upper portion of the bowels, which at night was often so severe that she could sleep but little. Numerous remedies had been employed, but to no purpose. Anodynes would modify the pain for a few hours only. Dioscorea effected a permanent cure within a short time.

Dr. Smith Rogers, of Michigan, has had a very extensive experience in the use of Dioscorea, and deems it a most efficient remedy. In reporting a case of so-called bilious colic he says that the patient had been unsuccessfully treated with various approved remedies for five days. A few drops of Dioscorea promptly terminated the pain, and the continued use of the drug for a short time effected a permanent cure.

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Dioscorea has valuable properties besides those found useful in the treatment of colic. In the nausea attending pregnancy it often affords much relief, and as a modifier of after-pains it acts in a very satisfactory manner. In dysmenorrhœa it aids in rendering the painful condition bearable, and in hysteria it may well constitute a part of the treatment. Hepatic diseases, especially when accompanied with irritability of the stomach, are among the wrongs in which indications for this agent are likely to be seen, and as a remedy for dysentery and all spasmodic affections of the stomach and bowels, it is of frequent usefulness. It is also highly esteemed by many physicians as an expectorant in asthma, whooping cough, and bronchitis.

Dr. A. W. Forbush, in a paper read at a meeting of the Boston District Eclectic Medical Society, speaks of Dioscorea in part as follows: "It is of great value in neurosis of the abdominal cavity, and all spasmodic affections of whatever name. It has a strong affinity for enfeebled mucous tissues which become painful from spasmodic contraction of their muscular fibres. It is as much a specific in spasmodic conditions of the mucous membranes of the stomach and bowels, as is quinine in intermittent fever or malarial conditions."

Dioscorea is antispasmodic, diaphoretic, and expectorant. In large doses it is emetic.*

Among the most prominent specific indications calling for Dioscorea are the following: Abdominal muscles contracted when there is constant pain; colic, with sharp, cutting pains; pains in the abdomen, relieved by pressure or by supporting the abdomen; hepatic disorders, accompanied by irritability of the stomach; typhoid fever, when there is tenderness and tympanitis.

The dose of Specific Medicine Dioscorea is from one to twenty drops, but it is usually employed as follows:

℞	Specific Medicine Dioscorea, - - -	gtt. x to 5 i.	
	Water, - - - - -	3 iv.	
	M. Sig.—Teaspoonful every hour or two.		

In colic fifteen drops of the Specific Medicine should be given in a little very hot, sweetened water, every thirty minutes, until relief is obtained. The remedy should then be continued in doses of ten drops each, every hour, as long as needed.

*The remarks concerning the preparations of Dioscorea, on page 7, call attention to the presence of Saponin in the common tincture and fluid extract. Saponin is a very acrid substance and was absent, practically, from the decoctions that established the drug. The emetic qualities are absent from the Specific Medicine. L.

Sulphurous Acid.

(Specific Medicine.)

History and Qualities:—It has long been known that the "vapor" of burning sulphur possesses powerful bleaching qualities, is very irritating, and is destructive to life, especially its lower forms. Its power of arresting fermentation by "killing the yeast," and its value in certain disease expressions, dependent on the destruction of minute living organisms, has been a matter of general information from a very early period. Pliny is authority for the statement that the ancient Greeks and Romans utilized it in these directions.

So-called "vapor" of burning sulphur is not, however, the vapor of sulphur, but a gas SO_2 that results from the union of sulphur and oxygen. This gas is known as sulphur dioxide or sulphurous acid gas. It is very suffocating when inhaled, is destructive to coloring matters and lower forms of organic life. When it is passed into water, the two unite, molecule to molecule, ($\text{SO}_2 + \text{H}_2\text{O} = \text{H}_2\text{SO}_3$), the solution being known as Sulphurous Acid. This is in reality a compound in which the sulphurous acid radical, SO_3 , unites with basic hydrogen to form Hydrogen Sulphite which corresponds to the other sulphites. Thus,

Sulphurous Acid (Hydrogen Sulphite)	- - -	H_2SO_3
Sodium Sulphite,	- - - - -	Na_2SO_3
Potassium Sulphite,	- - - - -	K_2SO_3

Sulphurous Acid can also be made by other methods, such as the decomposition of a sulphite by means of sulphuric acid, or by depriving Sulphuric Acid (H_2SO_4) of one atom of oxygen by means of hot charcoal. This latter process is the Pharmacopoeial method of making the official solution, which carries not less than 6 per cent of its weight of sulphur dioxide.

By either method, however, it rapidly parts with its SO_2 gas, if it be exposed to the air, and also does this with varying rapidity when vials containing it are opened in the usual course of business. Besides, by the absorption of oxygen, part of the H_2SO_3 becomes sulphuric acid, H_2SO_4 , which contaminates the remainder. For these two reasons, even though it be prepared with great exactness, these subsequent changes result finally in its utter demoralization.

Sulphurous Acid was introduced into Eclectic practice at an early date. The first edition of "Specific Medication" (1870) carried explicit directions for its use, and Eclectic physicians commend it ex-

SULPHUROUS ACID.

tensively in all their literature. But, the uncertainty of the commercial preparations which, especially in warm weather, become very weak even to worthlessness, was a cause of great complaint and much concern.

In this direction, the manufacturers, likewise the dispensers, were powerless, because of the fact that, like other evanescent preparations, it possessed its original qualities, at but one period of its existence, viz., the instant it was finished. It can safely be asserted that no specimen of U. S. P. Sulphurous Acid that has been uncorked and dispensed from, will stand the test thereafter. In order to overcome this trouble as much as possible, we experimented in the line of various solvents and menstruums, and at last devised a basic menstruum, a sulphited sulphite, which holds its final SO_2 persistently. This preparation will not deteriorate beyond a certain degree, and it carries a large amount of its sulphite radical to the last drop.

The following experiments by Miss Margaret Stewart show the change that followed the exposure of the Specific Medicine Sulphurous Acid in an open graduate as contrasted with aqueous sulphurous acid under parallel conditions. For the purpose of comparing the results the Pharmacopoeial strength (6 per cent SO_2) was taken as the unit, or 100 per cent, the result obtained by each assay being reduced to this standard.

SULPHUROUS ACID.	SPECIFIC MEDICINE SULPHUROUS ACID.
June 28th, 98 per cent	107 per cent.
" 29th, 75 "	99 "
July 1st, 18 "	73 "
" 28th, 2 "	46 "

A like series of assays was made, of Sulphurous Acid and Specific Medicine Sulphurous Acid taken from 4 ounce corked bottles, as found on the pharmacist's shelves. This gave even more striking results than those tabulated herein.

The experiments demonstrate that when the commercial acid became valueless, the Specific Medicine carried as a sulphite radical, enough SO_2 to exert its marked influence. It is colorless, irrespirable, and can be applied to the skin without injury.

From the Specific Medicine label we extract as follows:

"Qualities: As originally made, like all other solutions of Sulphurous Acid gas, this preparation became less reliable as time passed, and ultimately lost all its sulphurous qualities. In order to correct this defect, we devised a basic menstruum, which retains indefinitely, in combination, a decided amount of sulphurous radical. Specific Medicine Sulphurous Acid carries a permanency that now permits it to be used in confidence that to the last drop in the bottle, the effect of this combined sulphite radical can be obtained."

SULPHUROUS ACID.

Since the aforementioned process was devised, no complaint whatever has ever been made of Specific Medicine Sulphurous Acid, which is the standard with Eclectic physicians. The following papers on the therapy of this proposition give its field of usefulness.

THERAPEUTICS OF SPECIFIC MEDICINE SULPHUROUS ACID.

From Specific Medication, by DR. JOHN M. SCUDDER.

"We consider Sulphurous Acid in the class of sulphites, rather than under the head of acids. We employ it as an anti-zymotic, and a parasiticide, and not for the common purposes of an acid, though here, as in the case of the alkaline sulphites, there must be the general indications for an acid, as there was with them for an alkali.

The Sulphurous Acid, like the alkaline sulphites, specifically antagonizes zymotic causes of disease. It is well to keep in mind the fact that this is something more than simply arresting or modifying the septic process, for we have already seen that the zymotic influence frequently destroys the life of the fluids and solids without producing putrescency. We prescribe sulphurous acid as an anti-zymotic in cases which present reddened mucous membranes, with brownish coatings of tongue and sordes. Given the indications for the use of an anti-zymotic, with the indications for the use of an acid, and we select the Sulphurous Acid.

Sulphurous Acid may be employed in yeasty vomiting, in aphthous mouth and throat, or wherever the presence of microscopic fungi is suspected, with the same certainty as the sulphite of soda. We also use it in porrigo, trichosis of scalp, and pityriasis versicolor, with excellent results. As a local application it should be diluted with from two to six parts of water.

I wish to call especial attention to its use in some diseases of the throat, by the spray or atomizing apparatus. In diphtheria, with dark redness of mucous membranes, and fullness with relaxation, there is no local remedy equal to Sulphurous Acid spray. It is equally beneficial in those cases of cynanche maligna, with dark redness of mucous membranes. Whilst in ordinary sore throat from cold, with dusky discoloration, it offers one of the best local applications in the *materia medica*."

To the foregoing may be added the very complete article by Professor Felter in *The American Dispensatory*, as follows:—

Medical Uses and Dosage:—The characteristic condition calling for Sulphurous Acid is one of a low state, with normal or increased redness of the tongue and membrane. The tissues are enfeebled, full and relaxed, and appear to have lost vitality; the pulse large and empty, the sensation under the finger being that of a large calibred vessel with a small stream of blood. The secretions are nasty, dirty, and exhale, as well as the breath, a peculiar, sweetish, mawkish odor. The membranes are reddened and dirty, or muddy in color. The tongue is characteristic, being coated over red, with a glutinous, nasty, yellowish-brown,

SULPHUROUS ACID.

or the coating may be transparent; and again, it may appear, as if fecal matter had been rubbed upon it. In later stages a moist glutinous, brownish fur may line the center of the organ. Occasionally the tongue is sleek and shining, like a piece of raw beef. Dirty sordes upon the teeth and lips; and the saliva is increased in quantity, viscid, and mawkish. When externally indicated, as in *erysipelas* and like conditions, the tissues are deep red, and appear to have lost vitality. The erysipelatous redness blanches more or less as the disease progresses, "sometimes in the center, sometimes at the border, sometimes in the deep structures, you seem to be looking through the superficial redness" (Scudder, Spec. Diag. 90). *Wounds and abrasions* seem to show a tendency to slough, and are bathed in dirty, sticky, unhealthy secretions. Added to these a depraved state with *yeasty vomiting*, and you have the uses for one of our most important antiseptics.

Sulphurous Acid has been largely employed as an external application in all *cutaneous parasitic affections*, and in which, before its application, the scales have been removed, so as to have the diseased surface directly exposed to the agent. For this purpose it may be applied pure, or diluted with glycerin or water, of the required strength. The use of glycerin, however, should be guarded, as it often acts as an irritant to the skin, as well as doing injury by abstracting water from the tissues, leaving them hard and dry. *Tinea tonsourans, versicolor, and favosa, urticaria, scabies, ringworm, and purpura*, are successfully treated with it. As a wash, or in the form of a spray, it has been found effectual in *thrush, diphtheria*, (with dusky coloration of membranes), *follicular pharyngitis, clergymen's sore throat, chronic irritation of the larynx and vocal cords, weakness or loss of voice* from the preceding cause, *chronic bronchitis, pertussis, asthma, wounds, and ulcers*. In these conditions it should be used internally also. *Mucous patches, tonsillitis, and mercurial stomatitis*, when having the characteristic indication, yield promptly to this acid. As an application to *sloughing wounds and ulcers*, with sticky, glutinous secretion, it is of marked value. Give it internally at the same time.—Am. Disp.

SPECIFIC USES AND INDICATIONS.

Uses.—Specific Medicine Sulphurous Acid is an anti-zymotic and a parasiticide. As an anti-zymotic it is indicated in cases presenting reddened mucous membranes with brownish coatings of tongue and sordes. It may be employed in yeasty vomiting, in aphthous sore mouth and throat; wherever microscopic fungi are suspected. As a local remedy it is useful in porrigo, trichosis of scalp, and pityriasis versicolor. By spray it is used in diphtheria with dark redness of mucous membranes, and in ordinary sore throat from cold with dusky discolorations.

Indications.—"Full, relaxed, dirty-looking tissues, with deep redness and sticky, unhealthy discharges; sweetish, mawkish odor of breath and discharges; saliva increased and viscid; tongue full, broad, atonic, normally red, with glutinous coat, either transparent or dirty-brownish, with effaced papillae; unhealthy, viscid wounds and ulcers;

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gastric derangements with yeasty fermentation. All the conditions are those of sepsis and debility,"—Am. Disp.

Dose:—

R Sp. Med. Sulphurous Acid, - - - - ʒj
Water, - - - - ʒiv

MISCE.—Teaspoonful at a dose. As a local application it is diluted with from four to twenty parts of water and applied freely.

SPECIAL.

The accompanying Treatise is a part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of *Materia Medica*, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressly for those fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional. The history, description, pharmacy, and chemistry will be written by John Uri Lloyd.

The next study (No. XV) will be of particular interest and of special value in that it will present an illustrated record of the progress of distillation from the earliest date to the present, as published in the 1905 *Gleaner*, now out of print. In addition, for the first time, will be shown the devices for distillation and concentration invented by the author of the pharmacy sections of these treatises which permit of concentration in a still the contents of which are cold.

Respectfully,

LLOYD BROTHERS,

CINCINNATI, OHIO.

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JANUARY 1, 1906.

The Development of the Pharmaceutical Still.

The portion from page 2 to 25 is from "The Eclectic Medical Gleaner," May, 1905. The publications furnishing the illustrations and the historical text are from "The Lloyd Library," principally as follows:

A Little Chemical Pleasure Garden, Daniel Stoltz, of Stolzenberg. Published 1624.
Chemical works, books, and writings of Johannes Rudolph Glauber, the celebrated philosopher and physician, Franckfurt am Main. Published 1658.

Description of the known salts, and especially of a curious salt as yet altogether unknown to the world. Published 1658.

For the Glory of God, and to add to the light of nature, this is described and uncovered by Joh. Rudolph Glauber. Published 1658.

Explanation of the words of Solomon, "Great is the virtue in herbs, words, and stones." Described by Joh. Rudolph Glauber. Published 1658.

Chemical writings of Basil Valentine, of the Order of the Benedictines. Published 1677.

Medico-chemical Pharmacopœa, or Pharmacological Treasure Chest. Joh. Schroeder (1600-64). Published 1677.

The Burning Salamander, or Decomposition of Substances Pertaining to Chemistry. Published 1687.

Curious and complete chemical writings of Geber, the king of the Arabs, keen philosopher and true adept. Published 1710.

Experimental Physico-Chemical Symposium of Hermes Trismegistus, or Chemical Laboratory of Johann Kunckel von Löwenstern, Royal Councillor of Mines and member of the Imperial Leopoldine Society. Published 1716.

From page 25 to 32 the illustrations are photographs from apparatus in Lloyd Brothers' laboratory, the photographs being made by Mr. W. J. Miller.

The Text of the entire article is by John Uri Lloyd, that part from page 2 to 25 being reproduced from "The Eclectic Medical Gleaner," May, 1905.

Treatise No. I embraces Thuja Occidentalis.

Treatise No. II embraces Cactus Grandiflorus.

Treatise No. III embraces Pilocarpus (Jaborandi.)

Treatise No. IV embraces Veratrum Viride.

Treatise No. V embraces Chionanthus Virginica.

Treatise No. VI embraces Asepsin and Asepsin Soap.

Treatise No. VII embraces Collinsonia Canadensis.

Treatise No. VIII embraces Nux Vomica.

Treatise No. IX embraces Gelsemium.

Treatise No. X embraces Belladonna.

Treatise No. XI embraces Oenanthe Crocata, Vegetable Caustic and Crataegus.

Treatise No. XII embraces Ergot.

Treatise No. XIII embraces Macrotys.

Treatise No. XIV embraces Dioscorea.

Treatise No. XV embraces Development of the Pharmaceutical Still.

Treatise No. XVI will embrace Scutellaria.

Drug Treatise, No. XV.

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BASILIVS VALENTINVS.

[For biographical sketch of Basil Valentine, see page 24.]

DEVELOPMENT OF THE PHARMACEUTICAL STILL.

[This (pp. 1 to 24) is a reproduction of an editorial by John Uri Lloyd, in *The Eclectic Medical Gleaner*, May, 1905.]

"The Alchemists were the 'Reformers.' Lights shining in the Dark. Men having Meat which their Adversaries knew not of. Prophets that walked with God."—ALEXANDER WILDER.

The Alchemist.¹—(See Frontispiece.) Tradition cites that in the very remote past once lived a personage, *Hermes Trismegistus*, the *thrice greatest*. According to some authorities, he was an Egyptian priest, but it is now generally conceded that the name is Greek for the Egyptian god Thoth.² Be this as it may, to Hermes Trismegistus is ascribed great scholarship, and from him arose the Hermetic Philosophy, or Hermetic art, now known as the "Philosophy of Alchemy."

The early alchemists extracted the juices of plants for medicinal use, employing therefor devices and methods inherited from afar back. Consequently the term alchemy did not at first relate to the science of primitive chemistry, but rather designated healers after the method of Galen. Long following the eminent physician of antiquity, Hippocrates, as well as Galen, whose subsequent system stood as authority for thirteen hundred years, came the society of alchemists, who constituted the bone and sinew of the mediæval European philosophers and experimenters. The alchemist of whom we speak (not the charlatan masquerading as such) was an inquiring man, a man of method and experiment, in contradistinction to those who before him had so largely dreamed their theories, and then established them by mental processes that rested on faith in statements that were based on imagination or intellectual con-

¹ The illustrations presented herewith (with two exceptions) are exact reproductions, much reduced from alchemistic and connected mediæval works in the Lloyd Library. To give their titles would require too much space, even in footnote type. The dates of the most important utilized herein are as follows: 1638 (2 works), 1677, 1698, 1697, 1710, 1716, 1754.

The exceptions are No. 12, from Oswald Schreiner's "History of the Art of Distillation and of Distilling Apparatus," and Nos. 15, 16, 17, 18, 19, 20, from "Geschichte der Destillirweisen und der Destillirgeräthe."

² Thoth, or Tot, was Secretary of the Divine College.

ceptions. The arts of Paracelsus, Hippocrates, Galen, the ancient Egyptians and Arabians had, it is true, brought to the mediæval European alchemist scintillations of fact that partly founded his methods, but his own experimentations in primitive chemistry and medicine gave him a marked advantage over those who, to his date, had as a rule made simple stews and decoctions of herbs and roots and such. The possibilities of concentration and purification



1. "FEW UNDERSTAND THEIR SYMBOLISMS."

Note the conspicuity of *Mercury*, the God of Science, Commerce, and of Darkness, but no less the protector of the arts and graces of life. He it was who guided the spirits of the dead to their final abiding places. Note his winged hat, winged sandals, and the caduceus in his hand, of which the serpents represent wisdom, the wings diligence, and the rod power.—*L.*

"In his hand he took *caduceus*, the snake wand,
With which the damned ghosts he governeth."

by distillation, and the amplified methods of refinement by which old compounds were decomposed and new ones formed, heralded with him a markedly progressive epoch. Improved apparatus and increasing knowledge of reagents that under his touch rapidly multiplied, marked the alchemistic day and date. Few persons in our modern time comprehend the ideals of these people, few understand their ever present symbolism (illustration 1). Entranced by the wonderful materialistic changes that took place before their eyes, they were

led onward by the marvels of distillation and sublimation as applied to herbs and earths, as well as to a few substances like fat and flesh and bone, and mixtures of such. Great were the thought outreaches of such men as Roger Bacon, the good monk Basil Valentine (see Plate I), and their co-laborers. It was the age of elixirs, distilled spirits, medicated waters, cordials, and life principles. No longer was the alchemistic art to be limited to simples, such as medicines and medicinal compounds. Marvelous transformations of materials, as well as the transmigration of the souls of materials, was exemplified in the changes apparent in elemental and compound matter. Expanding theories, as never before, and never since, engrossed speculative thought. Then blossomed at last the conception of the transmutation of the metals, under the influence of which, in some directions, enthusiasm ran wild. Might not the products of partly refined earths be even further purified from adhering grossness, and thus yield the precious metals? Numbers of important changes observed in alchemistic manipulations, led up to this hypothesis. For example, quicksilver (silver with life) was obtained by separating sulphur by distillation from a red-brown earth (cinnabar). Might it not be again refined, and by its separation from another portion of its earthy principle (sulphur), become pure silver? And, carrying the thought a step further, by yet another process of sublimation, wherein its last iota of sulphur should be eliminated, might not silver become pure gold? Might not any of the base metals, by means of this or other process of refinement, be transmuted into the nobler metals?¹ Surely the qualities of many of the substances produced by the alchemistic touch differ more from the original materials, than base metals differ from the noble metals. No longer should meditation concerning man and his destiny, or the contemplation of spiritual things, or rumination over past intellectual hypotheses, govern philosophy. Experimentation based on spiritual exaltation became the all needful process.

The Age of Experimental Evolution.—The age of experiment, of charlatanism, of persecution, of mistakes, of sacrifices, and of deeds burst upon the world almost simultaneously with the art of printing. Men devoted their thought, their fortunes, their lives

¹ General A. Hitchcock, "a student of the mystic," contended that the real purport of Alchemical transmutation was the transposing of the baser metals of our natural condition, by the use of "salt, sulphur, and mercury," into the pure gold of a regenerated nature.

to the work.¹ Volumes concerning medicine admixed with symbolism, astrology, religion, and alchemy were written, and after printing processes were perfected, the works were published, often at great expense. Few can appreciate the stimulus that this "occult art" and its ramifications gave to the men concerned in the printing of books. Close following the discovery of the art of printing, their publications were given to the world, bound in hog-skin or in real vellum, in boards or in parchment. Neither care nor expense was spared in print, paper, embellishment, or binding. They were bountifully illustrated and accompanied by expensive frontispieces, which often gave the portrait of the author, and be it remarked concerning the alchemistic author and physician, his was usually a pleasant face. Intelligence, meditation, wisdom, are shown in the features of the men brought to view in these exquisite frontispiece engravings that would honor a modern work (illustrations 2 and 3, plate III; see also plate I and II). Kings, scholars, churchmen, and physicians were entranced by the study that promised such great results (see Figures 4, 13, and 14). Imagination reveled in possibilities, as never had it done before. It was a day of wild speculation, of marvelous credulity, of chimerical visions, of hope and ambition, such as has not since been paralleled. Men spent their all, and sacrificed their lives in seeking the Elixir of Life, the Philosopher's Stone, the Alkahest. They made a record of their discoveries by word and symbol, as well as in allegory, but much that they recorded is not open to the understanding of the modern world. Can we blame the aged alchemist, nearing life's limit, for longingly hoping to discover the "Life Elixir" in which he held implicit faith? He experimented, and recorded the results in figures and in signs. The alchemistic votary in need of money intently sought the art of transmuting base metals into noble ones; he, too, made his record in symbolic language. Both alike desired the fanciful "Philosopher's Stone," which devotees of the alchemistic period believed could by its touch accomplish both results (Fig. 4). The "Alkahest" that these men believed no vessel could hold and to be capable of dissolving all substances, was scarcely less desirable. It was a living spirit, a much needed menstruum, which even the illustrious Boerhaave, the greatest scientific physician the world has even known, sanctioned on the authority of the

¹ To thoroughly comprehend this condition one need do no more than read "The Follies of Science at the Court of Rudolph II," by Henry Carrington Bolton.



JOHANNES KUNCKEL VON LOWENSTERN,
 1630.



2. NICHOLAS LEMMERY, 1754.



3. GEORGIUS DANIEL COSCHWITIUS,
1693.

[PLATE III.]

scholarly Van Helmont. The result of this search for the chimerical proved to be a mine of wealth in unsought compounds, which, discovered by rule of thumb and progressive experimentation, enrich our science of to-day. Out of it all was born modern *chemistry*, the science of the study of the changes in matter. Grant that much mystery prevailed, that error of thought dominated, that *charlatanism* tintured some conspicuous men in the alchemistic ranks, and that watchful impostors wedged themselves into the field, and used their false garments to dupe the gullible among whom were included scholars, nobility, clergymen. Admit that men speculated and deceived in those times, much as men to-day speculate on the credulous and deceive the unwary. Duplicity was then,

as now, inherent in mankind. And yet, the facts are, the persevering, self-sacrificing alchemist of old, served well his part. Physician was he, as well as chemical investigator. Devout was he in religious faith, combining with it all, perhaps, even the high office of



4. THE ALCHEMIST'S LABORATORY, 1624.

priest. Had he as a gift to humanity developed the art of pharmacy and of chemistry only in so far as the processes of distillation and sublimation extend, and added to the sum of human knowledge his empirical discoveries therein, his life record would have given us a rich heritage of deeds. Central thought in it all, the foundation of alchemical hopes, achievements, disappointments, all, all, rested on his loved retort and crucible.

Occultism.—This term, which then referred to the experimental study of matter in contradistinction to magic, witchcraft, astrology, theory, etc., is now widely misinterpreted, and generally misapplied. These alchemists of old were occultists, it is true, but not in the sense of meaningless incantation, irreverent superstition, and witchcraft. With the most profound reverence for the Su-

preme Creator, whose handiwork they searched, their science was based on the fact of experimentation, the object being the discovery of the concealed. By natural methods they sought the hidden. Theirs was a reverent study of nature and of matter, by methods that foreshadow the birth of the apothecary's art (Fig. 5), whose progress, to-day, is so largely aided by his gifts. But the ignorance and superstition of outsiders, as well as the attractive mystery within, the marvels in changing forms of material bodies, threw a seeming touch of magic upon the new, experimental science, which phase of the subject brought now its trials.



5. THE ALCHEMISTIC APOTHECARY, 1710.

The man who aimed to unravel the mysteries of nature by the simplest of methods and with sincere devoutness of spirit, was naturally misjudged by illiterate contemporaries. Suspicion was in the air, it was whispered from ear to ear. The Hermetic disciple was defamed by both ignorant and unfriendly persons. Men of the world, bound in prejudice and locked in arrogance, came to look askance at the man who dealt in bottled spirits. *Black* was such an art, in the eyes of both the dogmatic and the superstitious. Some even viewed such persons as being leagued with the evil one, the

"occult art" was to them as a secret compact with the powers of darkness. But, as has been shown, such occultism as this rested on experimentation in which was conspicuous the art of distillation, which is the real subject of our article. Having given this necessarily brief introduction of the men concerned in primitive distillation, we shall now more directly refer to:

The Process of Distillation.—The modern physician scarcely realizes his obligation to the empiricist of days gone by. Nor does the pharmacist of to-day often appreciate the laborious travels of his mixture of sciences, as it journeyed from out the very distant past. The history of the art called pharmacy, as shown in the contrasted records of the ages, is in itself a rare story, inseparable from and dependent on the evolution of the still. On the *retort*

(illustration 6), the *matrass* (7), *cucurbita* (head, 8), which together constituted the primitive *alembic* (9) of alchemical lore, rested the science of alchemy. They led the way to our most modern forms of distilling apparatus, which, differing principally, as we shall see, by mere changes due to natural evolution, are to-day



the life of both chemistry and pharmacy. Our aim is not to make a complete treatise on the subject, which would require a volume, but to illustrate graphically the distilling feature of the art, by means of a brief pictorial story. By a few selections of gleanings we hope to gather a few of the evolving forms of alchemistic apparatus and connect them with devices of the present century. But it must be remarked that at every period, distinctions in workmanship as well as of intellectual attainments have distinguished the efforts of different individuals. This is no less true of the present



than of the past. The alembic and retort of one workman might be much better finished than those of another. Likewise one man might be more gifted and erudite than another. So, their artistic conceptions differed, as shown in their book illustrations. With this thought in mind, contrast the rude alembic shown in figure 9, with those more finished, shown by cuts 10 and 11.

Early Pharmacy.—The beginning of the art of pharmacy, like that of alchemy, is lost in the mists of prehistoric times. Incanta-



13. SHOWING THE SYMBOLISMS OF ALCHEMY.

tion, mysticism, religious rites, sorcery, and much ceremony, were once its dominating features. Complex stews and repulsive concoctions were its traveling companions. This is history. The Arabians of old and the Egyptians of ancient times contributed but a scant part in manipulative science to those who followed, although a few sketches of chemical apparatus are shown in manuscripts that far antedate the art of printing (Fig. 12), whilst scarcely anything of this description comes down to us from the famous father of Alchemy, Hermes, the thrice greatest. Then came at last as

has been said, the Mediæval Ages, and the European alchemists, those much misunderstood men whose ideals and ambitions in connection with distillation we shall now briefly examine.

We have stated that more or less symbolism, ceremony, astrological as well as religious rites, and other inheritances from out the past, prevailed to an extraordinary extent, tincturing even the most talented. This is shown by the ac-



14. SHOWING THE SYMBOLISMS OF ALCHEMY.

comparing rude illustrations, in which the good offices of the priest, king, and queen, are pictured in connection with alchemistic distillatory ordeals. (Figures 13 and 14; see also 4, p. 9.) Note



15. FLASK.



16. RETORT.



therein the Astronomical characters, the pictured elemental forces, and the curious symbolic figures of living creatures throwing their spells over the alchemist at work. Puzzles are some of these to our



17. CIRCULATORY APPARATUS.



18.

present-day philosophers. But the books in which they appear were printed in a day of astronomical and astrological symbolism and legend, as well as of belief in the "doctrine of signatures,"



19. ALEMBIC.



20. RETORT.

wherein diseased organs were treated by means of plants and the leaves of plants that bore fanciful resemblances to the affected

parts, as, for example, Hepatica herb, which because of its trilobed leaf was introduced to cure liver disorders. This curious theory of "like cure like," or the doctrine of signatures and symbolism, was not confined to medicine. It patterned even the designs of the



21. PRIMITIVE PLAIN
RETORT.

22. PRIMITIVE TUBU-
LATED RETORT.

23. CRUCIBLE.

rude distilling apparatus of the alchemist, that were fashioned to bear fanciful resemblance to fish and bird, beast and man (Figures 15, 16, 17, 18, 19, 20). But, let us ask, why should not even the Churchman, whose mission leads to meditation on the spirit-world, have been a companion and friend of him who sought to trap the spirits of mundane things? Why should not royalty have con-



24, 25. ESCAPE OF THE LIFE ESSENCE
(SPIRIT).

26. DEVICE FOR CATCH-
ING THE "SPIRIT
OF SALT."

cerned itself in the vagaries of a science that was destined not only to revolutionize commerce and war, but to dominate human life and action, as well as transmute base metals into gold and silver. Had not such doctrines prevailed from the day when the signs of the zodiac, and the heavenly constellations as well, were fancifully named from fish, bird, reptile, and man? Pictures from the past had served as symbols in mythology, figures had served as writing,

and jewelry had been fashioned in imitation of familiar forms of living creatures. Why should not the implements of the alchemist respond to the all pervading conceptions of the day?

The Spirit of a Thing.—Great were the anticipations opened to men of thought and speculation when, by experiment, the rudimentary retort (illustrations 21 and 22), and the crucible (23), opened their eyes to possibilities. *The spirits of things were actually being caught.* Did not the life-essence escape when heat was applied to a crude substance (illustrations 24 and 25)? Could it not be enslaved if one but comprehended its nature (illustration 26)? Now it was that, as has been intimated, men went wild in speculative anticipation. Numberless were the devices contrived to accomplish such recondite objects close connected with distillation. Marvelous were the attributes ascribed to the essential souls of matter. Many persons to-day are disposed to ridicule such philosophy as this. But, it may be asked, had not these men a good basis for their reasonings? Let us see. Did not red wine, under the influence of heat, yield a colorless, inflammable



27. DESIGN FOR DISTILLING BRANDY. (Credited to Geber.)

liquid, the very life-essence of the liquor which, named by them in accordance with its intensified character, the "*spirit of wine*," is now known as brandy (illustration 27)? Oil of vitriol and salt, mixed and heated, gave by the condensation of its spirit, a vicious, smoking liquid, the "*spirit of salt*," as the alchemists' nomenclature named it. Now it is called hydrochloric acid.¹ A mixture of saltpeter (niter), alcohol, and sulphuric acid distilled, yielded a mild, fragrant spirit, named by them Sweet Spirit of Niter, in contradistinction to the sour spirit obtained by distilling niter and sulphuric acid without alcohol, which (nitric acid) by reason of its energy, they called aqua fortis. So, from many familiar substances arose essences that were the very life principles of the substances yielding them, for by their escape, the parents were destroyed, whilst the purified essences possessed their dominating qualities. There was a spirit in cinnabar (quicksilver), a spirit in

¹ The alchemist named substances by reason of their origin or their qualities. Modern chemistry aims to ignore these considerations, and recognize only their molecular constructions. And yet it is often difficult to evade the origin of a thing. Thus "Oil of Vitriol" of alchemy is "Sulphuric Acid" to-day, in which, by either name, it is apparent that its origin is sulphur.

the trees (turpentine), a spirit of various herbs which, distilled with spirit of wine, made, for example, "Spirit of Rosemary," "Spirit of Peppermint," and "Spirit of Lavender," each partaking of the attributes of the tree or plant manipulated. Every form of matter seemed possessed of an active soul, a characteristic spirit, and the names given by the alchemists of old to such products as these are yet with us, and are recorded by our pharmacopœia of this new century.

The Science of Fire.—As it became generally evident to intellectual thought that throughout different forms of matter unseen spirits lurked, essences that could actually be expelled and again caught by distillation, the votaries of the occult (experimental) art turned their intensest thought, method, and means to that



28. 29. FIRE IN ALCHEMY.

object. Heat was found to be universally essential to the liberation of a spirit. Cold, the antithesis of heat, was essential to its condensation. The utensils most necessary to successfully further the end were consequently all-important. In this light, let us study the record of the alchemist, as shown by the illustrations so carefully preserved in his loved manuscript, and, behold! how diversified are the distilling devices he portrayed so explicitly. See how fire plays its part in the record left by these earnest men (illustrations 28 and 29). With this thought of fire in mind, reflect over the entire collection of curious illustrations herewith presented, portraying, better than can words, the importance of fire to alchemy. Fac-simile selections are they from a number of volumes in the Lloyd Library, that gave us these selections, and that carries hundreds of designs of a similar nature.

Wonderful were the possibilities that opened to him who comprehended the power of the science of fire.

Distillates.—The general term "distillation" came at an early date to be applied to the art we have described, the art of separat-

ing and collecting the "souls of things."¹ But long before the threshold of the present day was reached, differentiating terms were necessarily applied to the volatile products. The spirits of some things were found to be liquids, of others, solids. Although



30, 31, 32. DISTILLATION.

distillation gave rise to both, the class of liquids, only, came to be generally distinguished as *distillates*, whatever vaporized and condensed as a fluid, being so defined. Many were the devices con-



33. SUBLIMATION.

trived for liquid distillation (illustrations 30, 31, 32). The alchemist reveled amid the products that sprang from his retorts and alembics, and named them in accordance with his nomenclature. Thus we have the "distilled vinegar" (acetic acid), "Spirit

¹ The term distillate was not always clearly defined. Thus, in some cases, fixed oils and fats were included with the distillates. These were causes of confusion.

of wine" (brandy), and "*distilled spirit of wine*" (alcohol), as well as a host of similar substances, many being known to-day under alchemical names.

Sublimates.—But, as has been stated, not every exalted life principle condensed as a liquid. Some, like sulphur or sulphur,



DESIGNS FOR SUBLIMATION.

arose as volatile spirits, to assume the solid form on condensation. Still, all were highly refined, as contrasted with the gross form of matter that gave them birth. (Illustration 33.)

"I am sublimed! gross earth,
Support me not! I walk on air."

Such forms as these must be separated from the liquid distillates, and were naturally called *sublimates*. Thus were named the



DIFFERENT DESIGNS FOR SUBLIMATION. Fig. 38 is a diaphragm to insert in Fig. 39.

corrosive sublimate of mercury, or corrosive sublimate; sublimed flowers of sulphur; sublimed iodine; sublimed sal ammoniac; sublimed flowers of benzoin; and numbers of similar bodies, that, purified by fire, were obtained by processes which drove the ethereal spirit out of gross matter, to condense in solid form. Sublime!

essences were they of the things themselves. But, inasmuch as they would not flow, but solidified in the cool part of the alembic's tube, thus stopping the process, caps or domes were necessarily placed directly over the mouth of the retort, or on a bowl (illustrations 40, 41). Within this cap the spirit congealed, forming often,



40. DOME. 41. PAPER DOME.
[For Sublimation.]

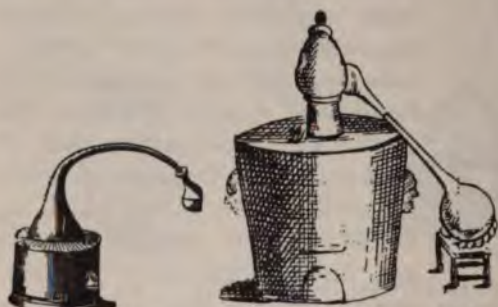
beautiful figures and surface tracings, resembling *flowers*. Hence came the name *Flowers* of Sulphur, *Flowers* of Benzoin, etc., names that linger with us still, but which the unwary often corrupt into *flour* of sulphur, etc. These contrivances for sublimation (illustrations 34, 35, 36, 37, 38, 39) rivaled in form and design those for distillation.

The simplest of all, a paper cone resting in a pan, (Ill. 41) produces an exquisite quality of Aromatic Benzoic Acid, of a flavor superior to any found in the modern market. This was used in compounding the original *Elizir Paregoricum* of the olden time, from which came our coarser substitute, the official *Paregoric* of to-day.

If we now review the preceding pages, it will be seen that the designs of distilling apparatus presented therein, are of the simplest description, especially as concerns the position the all-important retort or matrass occupies, as concerns its help-mate, the receiver. In fact, it will be observed that all are but deviations from the primitive forms shown by the simplest illustrations, including, indeed, the drawing (illustration 12), taken from an ancient manuscript. It will be noticed that the vapor is, in all cases, conducted from the heated vessel directly into the receptive flask, no attempt being made to cool it by any method whatever. Under these conditions, the most volatile substances must largely escape, whilst even the heavier vapors are wastefully lost. Excepting illustration 29, in which the curved neck of the retort is unduly lengthened, and illustration 27, in which is shown an ingenious water jacket hood, over the cucurbita of the retort, all the patterns are typical of primitive simplicity.

Let us now revert to our remarks (p. 11), concerning the "distinctions in workmanship, as well as of intellectual attainments," that distinguished different men in those days, and add that they

apply particularly to devices connected with those shown. Many contemporaneous experimenters were far behind others in operative method. Indeed, no precise date can be selected as that in which came the upward step that gave to science the worm, the column, the hooded still, and the water jacket, as improvements on the more

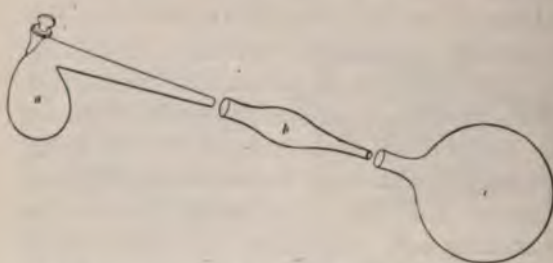


42. LENGTHENED NECKS TO RETORT AND RECEIVER.



44. EARLY ADAPTOR CONNECTING RETORT AND RECEIVER.

simple retort and alembic. These came unevenly in an age of struggling experimentation, in which is most beautifully typified the influence of environment and intellect on the blossoming of a budding thought. From out those old works can be selected quaint il-



45. MODERN ADAPTOR CONNECTING RETORT AND RECEIVER.



46. TUBE COOLED BY WATER.

lustrations that graphically anticipate the most approved apparatus of the present, and that show, if we care to make the comparison, that we, too, are but a part of the evolutionary process under consideration. Let us then consider the

Development of the Worm.*—Illustrations 42 and 43 present a painfully lengthened neck to a retort and a lengthened receiver indicating an attempt to partially cool the vapor of the substances distilling. In illustration 44, we have this neck further lengthened by a connecting pipe, or adaptor, which is practically the same as the adaptor, illustration 45, reproduced from a standard authority of to-day. Illustration 46 introduces as a step further, a water barrel, through which a straight tube passes from the retort to the receiver, thus giving a first glimpse of a cooling medium about the tube, whilst illustration 47 gives this tube a slight curve, designed



rather to impart direction to its exit from the barrel, than to increase its length. In illustration 48 is shown a condensing worm, such as is used to-day by those who employ antiquated condensing apparatus, illustrations 49 and 50 being cuts from a work at present considered an authority, but which, it is seen, differ little from the preceding. Thus can be shown the evolution of the modern worm, from the retort (No. 6) figured on page 11, to the present.

Development of the Liebig Condenser.—The Liebig Condenser was devised by the famous chemist, Justus von Liebig, after whom it is named (illustration 51), and is in reality a handy water-cooled

* *Let it be distinctly understood that these illustrations are offered to show how selected designs can illustrate the development of the condensing worm of to-day. They do not occur in sequence, so assorted, in the original works.

tube. This admirable device may also be connected with the pictured past, without seriously straining one's imagination. Take, for example, illustration 52, in which the head, or cucurbita, is surrounded with a jacket to hold water, and connect with it illustration 53, in which is shown a lengthened zigzag vapor tube above the retort, its apex surmounted by a similar water-jacket, and we



51. LIEBIG CONDENSER.

52. WATER JACKET
ABOUT CUCUR-
BITA.53. ZIGZAG AIR-
WORM-

have but to correspondingly lengthen this jacket, so as to include more of the tube, in order to accomplish, practically, the device under consideration.

Fractional Distillation.—That the alchemical investigators were aware of the value of differentiating temperatures in mixtures of vapors, is evident. Illustration 53, before us, shows a stagger

54. ANGULAR AIR-COOLED
WORM.

55. DOUBLE RETORT.

56. FRACTIONAL
DISTILLATION.

towards the column, for it is evident that the more easily condensed substances will constantly trickle back from the air-cooled zigzag worm, into the retort. This is also exemplified by illustration 54, in which the worm abruptly steps up and then down, thus making an air cooler between the retort and the final water barrel. The most easily condensed liquid naturally flows back into the retort, from the top of the worm. Fractional distillation is also exemplified by illustration 55, in which two long-necked retorts are

connected, the second being either warmed or cooled from below, as necessity requires. This device can also be used for washing gases. But perhaps the forerunner of the modern column is best illustrated by illustration 56, in which is shown four cucurbitas, one above the other, each separately connected with a receiver, thus collecting in fractions the various products of condensation, as the temperature decreases, from below, upward.

The Water-Bath principle is frequently illustrated in these old alchemical works, even to the multiple operation. Illustration 57 shows a battery of four distilling retorts, either steam or water, as the temperature and liquid varies, being employed to heat the set. Observe the upright funnel in the center, ingeniously devised for the purpose of replenishing the water, without disturbing the process. It may be safely said that our modern makers of such ap-



57. WATER BATH FOR FOUR RETORTS.



58. APPARATUS FOR MAKING ESSENCES AND ESSENTIAL OILS.



59. WORKMAN, RETORT, AND RECEIVER.

paratus as this, would find it difficult to improve on the forms of water bath and sand bath presented in the old volumes before us.

Herb Distillation.—The remedies employed in mediæval times were bountifully described in contemporary herbals and pharmacopœias. These indicate the importance to mediæval medicine, of the distilled, medicated waters, and the spirituous liquids from plants. Many were the ingenious devices contrived to accomplish these objects, all based, as at present, on the dissipating and carrying power of steam. Illustration 58 demonstrates how, by placing the herb in the barrel next to the retort, then passing steam from the retort from below upward through it, then conducting it into the worm in the second barrel, condensation of the vapor carries into the receiver the "essence" or "spirit" of the drug. In this way, the essential oils were also obtained about as they are now, by those who make oils of wintergreen, sassafras, etc.

Having thus briefly gleaned a picture-story illustrative of the dawning day in pharmacy manipulation, as concerns the develop-

ment of the pharmaceutical still, it may be well to repeat that these illustrations are but a few selections from volumes carrying hundreds of unique and interesting designs. They are all much reduced, some of the engravings, in the original, occupying full pages. That the apparatus pictured is not necessarily small, because our illustrations are not large, is shown by illustration 59, wherein the alchemistic author has represented a workman standing beside a retort. From this one can judge of the relative size of the others. It may be added that apparatus of those times was constructed of glass, porcelain, earthen-ware, lead, copper, and iron.

This practically brings us to the beginning of the nineteenth century, in which came the impetus given by steam to the arts and sciences. To illustrate the distilling devices that are employed in the various sections of modern industry, all based on the gifts of the alchemist of old, would occupy a volume. Our aim is mainly to picture the growth of the most important forms of apparatus employed in pharmacy, for on the distilling apparatus of pharmacy depends the life of the art. It is, however, to be hoped that some persons will be led by this study to frame a kindlier opinion of the earnest men, long since gone, who too often sacrificed their lives in a section of science that, from the necessity of the case, needs have been painfully, patiently, and very slowly developed.

BASILIVS VALENTINUS (Basil Valentine.) (See Plate I.)

A celebrated alchemist, born 1410. He was a Benedictine monk and occultist (scientific experimenter.) Of his many publications, the best known is perhaps "The Triumphal Car of Antimony." The authentic portrait of this illustrious alchemist presented herewith is a *facsimile* natural size reproduction of the frontispiece of Father Valentine's writings, collection of John Nauman and George Wolff 1677. The original volume is in the Alchemistic Section of the Lloyd Library.

¶ THE BENEDICTINE MONKS constitute a religious brotherhood founded about 530 A. D., at Monte Cassino, Italy, by St. Benedict of Nursia. The rules enjoined silence, and useful industry when not engaged in divine service. Every monastery was possessed of a fine library, and every monk used his pen in writing and manuscript copying. These monasteries became renowned centers of learning and study. They were open to all persons, ages, and callings, the term "A Benedictine" being synonymous with erudite scholarship. Of this industrious and serviceable brotherhood was Basil Valentine, his efforts being devoted to chemical investigation and connected records. Modern writers speak of Basil Valentine as an *alchemist* or occultist; but such alchemy as his founded modern chemistry, and such occultism as his devised the famous Benedictine Cordial, distilled first by the Benedictine Monks at Fécamp, in Normandy.

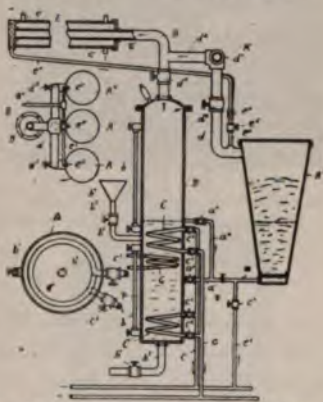
DISTILLING APPARATUS OF THE PAST, CONTRASTED WITH
THAT OF THE PRESENT, WITH A DESCRIPTION OF A
NEW DEVICE FOR CONCENTRATING ORGANIC
PREPARATIONS.

The foregoing treatise concerning the alchemists and their connection with the progress of distillation is reproduced from a paper contributed by its author to the *Eclectic Medical Gleaner*, May, 1905. This paper also portrays, indirectly, the growth of primitive chemistry and pharmacy from the earliest period to the beginning of the eighteenth century, at which date steam became a revolutionary factor in all sections of scientific progress.

This *Gleaner* publication resulted in many letters asking that the record of the Art of Distillation be extended, the generally-expressed desire being that it include not only the usual modern apparatus, but also that invented by the author (illustration 60), and employed in his laboratory for the special manipulation of delicate vegetable structures, the purification of alcohol and spirits, and the concentration of organic compounds that will not bear the continued application of high temperatures or of hot vapors. And, let it be added, such data must

necessarily to an extent be personal, if the paper on pharmaceutical distillation is thus made complete as concerns the evolution of the Pharmaceutical Still from its introduction to the present day.

Superheated Steam and the Vacuum Still. — The interval between the date last cited (page 24) and the beginning of the present century is marked by no particular change in the fundamental principles established by the alchemists of old. A liquid to be concentrated or distilled was then, and is yet, boiled by the application of heat applied to the bottom of the vessel or to the body of the liquid. The apparatus shown in illustrations 9, 10, and 11, as well as the other devices for distillation utilized in the primitive past, work upon the principle of the modern retort



60. Device invented by John Uri Lloyd for concentrating liquids and purifying alcoholic spirits by distillation from a cold still. This is fully protected by patent.

shown in illustration 45, whilst the retort and condenser figured in the very latest work on chemistry (illustration 51) differs but



61. Pharmaceutical still (old style), steam-jacketed bottom. Laboratory of Lloyd Brothers.

little in form, and none in principle, from the primitive alembic of the alchemist. The still that is illustrated by illustration 61 is the usual form of the commercial distilling apparatus of to-day. It stands in the laboratory of Lloyd Brothers, where for many years it served a useful purpose in the art of manipulative pharmacy, until it was finally displaced by the perfected devices yet to be shown (illustrations 64 to 67).

We find at the present date, as in the past, a multitude of variations in the shape and scope of distilling apparatus devised for special purposes. The still used to-day for making medicated waters and essential oils (illustration 62) is seemingly more

complex than that used by the alchemist for the same purpose (illustration 58), but yet it works on the same principle. The apparatus for distilling glycerin by means of superheated steam, which process gives a uniform, very high temperature, boils the glycerin just as the alchemist of old boiled the contents of his retort. Superheated steam would, however, quickly burn the life out of an organic solution should it be used in the pharmacy of plant products. The reverse of this, so far as temperature is concerned, the vacuum-still (illustration 63), works upon the same old boiling principle, excepting that the temperature of the boiling liquid is lower than when it is under atmospheric pressure.



62. Apparatus for distillation of volatile oils. 8,000 gallons capacity. [From "The Volatile Oils," by E. Gildemeister and Fr. Hoffmann, 1900.]

All of these forms of apparatus act on the principle of a boiling kettle, which in nowise differs from the principle of the primitive distilling devices of early pharmacy. The apparatus to follow, being so radically different from all of these, and designed for the manipulation of plant preparations, requires, then, a brief preliminary discussion regarding some of the difficulties of plant manipulation.

Concerning Plant Pharmacy.—Our special line of study has led us to consider a plant's texture as both a very delicate and a very complicated structure. Each plant or part of a plant must necessarily be investigated separately, for each is a thing in itself. If one does the problem full justice, discriminative thought and a kindly touch must be indulged. The heroics of evaporation, concentration, and abstraction are to be studiously avoided. A vegetable structure is a wonderfully complex whole, from which the abstracting of a part, or even a fragment, too often demoralizes the delicate fabric from out which it has been broken. The true pharmacy of a plant structure is, therefore, in our opinion, based on the rational study of its marvelous inter-structural complexity, each plant being possessed of qualities unlike those of any other. Even lengthened boiling of a vegetable solution, be it by concentration, in the vacuum still, or by ordinary air pressure evaporation, breaks these natural combinations into products new and strange.



63. Lentz's Vacuum Apparatus. [Proceedings American Pharm. Assoc., 1878.]

The Old Methods of Evaporation. — From all time decoctions and infusions have been "boiled down" by the method of evaporation and distillation illustrated so bountifully in the preceding pages and employed to-day in pharmacy and the arts. The heat is applied to the *body* of the liquid, or directly to the vessel's bottom, be the apparatus a kettle, the ordinary jacketed still (illustration 61), superheated steam,¹ or a vacuum pan (illustration 63).

¹ Superheated steam is made by running steam in a pipe through a very hot medium, such as a flame or melted metal. It can be thus brought to any temperature.

Under these conditions the liquid first gets hot, then commences to boil. The evaporation or distillation begins at, or near, the liquid's bottom, and progresses during the entire process of concentration. This boiling process alters or destroys delicate plant products exposed to the continued influence of the hot vapor and the action of the boiling liquid. Even the most stable organic structures are more or less affected, a fact familiarly illustrated by the chemical and structural changes produced in cooking fruits and vegetables. The necessity of avoiding this destructive action of prolonged heat, so apparent in products of the ordinary still, gave rise to such devices as the vacuum-still, in which the temperature of the boiling liquid is much lower than that developed under atmospheric pressure. But yet the vacuum process is necessarily long continued, and is consequently, in a degree only, less destructive to delicate organic vegetable structures than the usual boiling process. To avoid this lengthened boiling influence, whether in the open kettle, the ordinary still (illustration 61), or the vacuum pan (illustration 63), has for many years been one of the objects of our experimentation. On its accomplishment depended the ultimate perfection of our pharmaceutical processes and special products. *We believed it possible to abstract the volatile liquid from a juice, or the solvent from a percolate, by a temperature applied for a few seconds only.* And this principle, established (see illustration 60), proved to be the keynote to the whole theme.

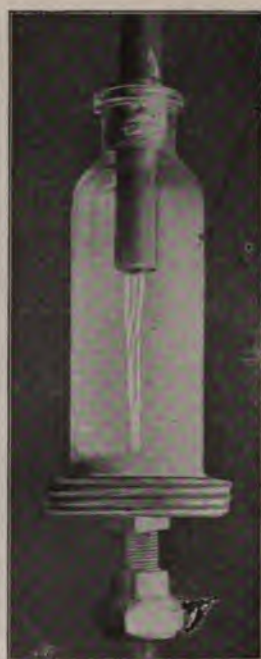
Method of Evaporation.—Let it be distinctly understood that we do not now refer to a mysterious something, or to a form of purposely hidden mechanism, but to a device open to inspection and based on the scientific application of well-known natural laws. Briefly stated, the invention operates upon the principle that cold liquids descend and warm liquids rise, and that, unless a liquid be heated until it boils from its bottom, evaporation proceeds from its surface. To this it may be added that a heated liquid separates into different circling zones each of a different temperature. This fact was illustrated years ago by the inventor of the present apparatus while studying one phase of this problem.¹

¹ If the reader is interested in the subject of liquid currents and the circulation of liquids of different gravity, we refer him to the lines of experimentation on this study by the author, illustrated in the Proceedings of the American Pharmaceutical Association. These indicate how long these experimental studies in evaporation and distillation have been in process.

The New Device. A Cold Still.—Let us anticipate by stating that the liquid, even in the largest concentrator illustrated herein, when distillation is progressing rapidly (illustration 64 to 68), is neither hot, nor yet warm. *It is cold.* So seemingly contradictory and apparently impossible of achievement is this



64. Working still (cold liquid) detailed in Fig. 60. This is in full process, but is cold, as shown by operator's hand on the still.
Laboratory of Lloyd Brothers.



65. Observation glass, showing stream of condensed liquid from cold still, detailed in Fig. 60. Also shown by A in Figs. 64 and 66. Laboratory of Lloyd Brothers.

statement that men experienced in laboratory work, whose lines of thought have naturally been in touch with distillation and evaporation by ordinary methods, when standing before one of these stills in full manipulative process, can not appreciate that the *contents* of the still are cold, and in no instance have they accepted this to be a fact without actually touching the still.

The observer of the new method of distillation beholds a cylinder (B, illustration 60) that is at once both a concentrator

and a still, for it simultaneously concentrates the solution and distills the menstruum. This cylinder holds a *cold liquid*, from the surface of which the menstruum rapidly evaporates, passing as vapor to another cylinder (E, illustration 60), where it is condensed, thence back upon and through the drug in percolator



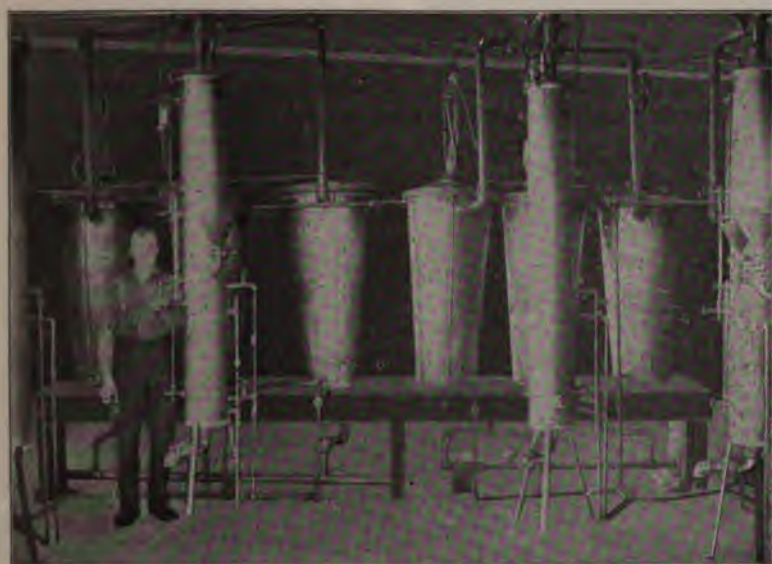
66. Device (Fig. 60) illustrating still in process.
Laboratory of Lloyd Brothers.

(A, illustration 60). He observes in the glass the rapidly flowing condensed distillate (illustration 65),¹ and perceives that it springs from the liquid in the body of the still (B, illustration 60), but yet touch only can convince him that *both of these liquids are cold*. (See the workman's hand on the still in full process, illustration 64.) *The body of the cylinder (B) holding the distilling liquid might be filled with ice without retarding the process of distillation.* The abstracting menstruum that moves through the drug (A, illustration 60) pro-

gresses as rapidly or as slowly as the operator desires, and it distills from B as fast as percolation progresses. *The still takes care of all the percolate.* Regardless of whether it takes a day, a week, or a month to thoroughly abstract a drug, the process of percolation, distillation, and concentration continues automatically from start to finish, whilst the chilled contents of the still, or cylinder, holding the drug constituents, isolated from the zone of surface activity, are cold and absolutely life free. NO VITALIZED GERMS OR MICROBES EXIST IN IT; NO AIR IS PRESENT; FERMENTATION IS IMPOSSIBLE. Vegetable liquids, prone to putrefaction or to quick fermentation, remain unchanged and quiescent for weeks if a lengthened process of drug abstraction be necessary.

¹ This observation glass is also seen in the photographic illustrations A illustrations 64 and 65.

Time of Manipulative Influence.—Investigations to determine the limit of time consumed in the manipulative process establish that *less than twenty seconds* are required to remove the volatile part of the percolate, or solution, immediately after which the resultant product, *absolutely sterilized*, rests in the still, quiescent and cold, undergoing no change whatever until the end of the process.¹ Complex plant compounds and structures are comparatively unbroken, and solutions of the most delicate organic textures are readily, and almost instantaneously, brought to any desired degree of concentration.

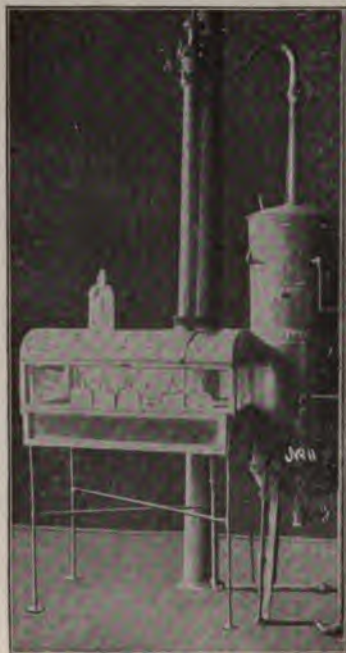


67. Showing six percolators and three stills of a battery of nine percolators. Laboratory of Lloyd Brothers.

Result of the Process.—This process is productive of remarkable results, both as concerns the abstraction of vegetable drugs and the preservation and concentration of the product. In the manufacture of alkaloids, resins, and other proximate plant products the advantage is markedly apparent, regarding both the quality of the product and the yield from the drug. Whether the operation be applied to small or large amounts, the process of concentration is accomplished *within the fraction of a minute*. To persons familiar with plant structures and the deleterious effects of the usual pharmaceutical processes, nothing further need be said to indicate pharmaceutical possibilities.

¹ The inventor has as yet given no rights in the direction of the concentration and sterilizing of milk, purifying of whisky and other alcoholic liquors, making of special extracts and other products. The apparatus is used only for pharmaceutical preparations, alkaloids, and resins in the laboratory of Lloyd Bros.

Historical Data.—We have already stated that the discovery of the apparatus described herein is not the result of an accidental blunder. It is the outcome of over twenty years of persistent experimentation pursued in the face of innumerable disappointments. In order that it may be appreciated that the statements regarding the capacity and utility of the apparatus are neither exaggerations nor untried theoretical conclusions, based on small experimental amounts, it need only be said that each of the percolators (two being shown in illustration 64) is capable



68. Distilled water apparatus by which the Ohio River water is made to stand the most exacting pharmacopœial tests. This condenser is completely silver-plated. Laboratory of Lloyd Bros.

of manipulating over 2,000 pounds of a drug. Over 6,000 pounds were in process in the two batches at the time the accompanying photographs were made, whilst the preceding batch of Still No. 64 consisted of over 3,000 pounds of Echinacea. At the time this is written 2,989 pounds of recent Gelsemium are in process in the mate to the apparatus shown in illustration 64, which, however, we do not illustrate. The capacity may, perhaps, be more readily appreciated if one but contrasts with the accompanying the men shown in the photographs (illustrations 64, 66, and 67), whilst the fact that never during the past year has one of the stills been idle a day indicates their practical utility and the comprehensive scope of the process.

In comparing this apparatus with all preceding forms for distillation it must be remembered that the temperature of the body of liquid in each still is not greater than the temperature of the surrounding atmosphere, although a large current of vapor passes continually, day in and day out, from its surface to the condenser, and thence, as solvent liquid, back upon the drug, transferring con-

tinuously its store of dissolved constituents from the drug to the body of the still. The apparatus is hermetically sealed during the entire operation, no appreciable loss of alcohol or other solvent occurs, nor is any handling of alcohol or of any portion of the concentrated liquid necessary. *No odor of alcohol or of the drug manipulated is perceptible in the laboratory, after the apparatus is sealed, during the entire process. Nor is there loss of drug fragrance or of evanescent constituent in the product.*

As an illustration of the progress in the distillation of water the illustration 68 is presented. It is capable of producing a distilled water from common Ohio River water that will stand the most exacting test of the Pharmacopœia. Indeed, the use of less than one-fifth the pharmacopœial amount of potassium permanganate does not show any organic impurity whatever. This still is silver-plated throughout.

A Treatise ON SCUTELLARIA,

AND

EMERGENCY DIRECTIONS FOR THE MANAGEMENT
AND TREATMENT OF OVERDOSES OF ENER-
GETIC DRUGS, MOSTLY OF
BOTANIC ORIGIN.

The record of Scutellaria in Hydrophobia is from the writings of Dr. Van Derveer, Dr. James Thacher, and the original pamphlet (1819), of Dr. Lyman Spalding. In connection therewith is the testimony offered by many physicians concerning its use in rabies.

The Therapeutic Uses are from the writings of Drs. Barton, Zollicoffer, Eberle, Dunglison, Ewing, Porcher, Youatt, Clapp, Tully, King, Scudder, the Dispensatories, and other authorities.

The illustration, (page 3), is drawn by Miss Eda Van Guelpen, from the original Frontispiece of Thacher's Dispensatory, (1812), and Spalding's History of Scutellaria, (1819). The illustrations (page 13), are pen drawings by Miss Eda Van Guelpen, from illustrations in the American Dispensatory, (1900).

The History, Pharmacy and Chemistry of Scutellaria are by John Uri Lloyd.

The article on Acute Poisoning and its Treatment, is by Harvey Wickes Felter, M. D., and is reproduced from The Eclectic Medical Gleaner, May, 1908.

For a list of the Drug Treatises issued to date, see page 2, this Treatise. For detailed uses, see pages 20-32.

DRUG TREATISE, No. XVI.

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Twenty-four Treatises on Drugs and Medicines.

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 - Treatise No. IV embraces Veratrum Viride.**
 - Treatise No. V embraces Chionanthus Virginica.**
 - Treatise No. VI embraces Asepsin and Asepsin Soap.**
 - Treatise No. VII embraces Collinsonia Canadensis.**
 - Treatise No. VIII embraces Nux Vomica.**
 - Treatise No. IX embraces Gelsemium.**
 - Treatise No. X embraces Belladonna.**
 - Treatise No. XI embraces Oenanthe Crocata, Vegetable
Caustic and Crataegus.**
 - Treatise No. XII embraces Ergot.**
 - Treatise No. XIII embraces Macrotys.**
 - Treatise No. XIV embraces Dioscorea.**
 - Treatise No. XV embraces Development of the Pharma-
ceutical Still.**
 - Treatise No. XVI embraces Scutellaria.**
 - Treatise No. XVII embraces Mangifera Indica and The
National Pure Food and Drug Act.**
 - Treatise No. XVIII embraces Libradol.**
 - Treatise No. XIX embraces Sulphurous Acid, Hydrochloric
Acid, Carbolic Acid, Sodium Sulphite, Sodium Phos-
phate and Ferri Acetas.**
 - Treatise No. XX embraces Cupri Acetas, Carbo Vegetabalis
and Triturated Podophyllin.**
 - Treatise No. XXI embraces Apis, Tela Araneæ and Canthar-
ides [in press].**
 - Treatise No. XXII embraces Opium, and its Eclectic Sub-
stitutes.**
 - Treatise No. XXIII Hydrastis Canadensis.**
 - Treatise No. XXIV will embrace Resnoids, Alkaloids, and
the so-called Eclectic Concentrations.**
-

LLOYD BROTHERS, Cincinnati, Ohio.

SCUTELLARIA.

Parts Used.—The leaves and twigs of *Scutellaria Lateriflora*.

Common Name.—Skullcap, Mad-dog Herb.

History.—This plant, like some others (see *Chionanthus*, Drug Treatise No. V), was introduced for one purpose, which, being lost, was replaced by others. Another conspicuous example of a drug with a like history is Coca, which was introduced as a stimulant, considered in the light of a substitute for tea and coffee, then abandoned as inert by no less an authority than Dr. E. R. Squibb, and was finally found to possess most marked qualities as a local anesthetic.

Before the day of the publication of the first American *Materia Medica*,¹ Dr. Lawrence Van Derveer, of New Jersey, to whom may be given the credit of its introduction, used *Scutellaria* in his practice, believing it to be of exceeding value.² Dr. Van Derveer employed *Scutellaria* as a remedy for hydrophobia, and has been charged with keeping his remedy a secret, which is a mistake. Although he became celebrated as an expert in treating the disease, there is no evidence

to show that he ever kept the name of the drug private. For forty years he had a widely extended neighborhood reputation as a specialist in hydrophobia, during which time he treated as many as four hundred persons (an



SCUTELLARIA LATERIFLORA
*or species of SKULL-CAP used for
curing the bite of mad dogs, by
Jesse Lewis of West Chester.*

*Facsimile of Frontispiece
in Thacker's "Observations
on Hydrophobia" (1812) and
Spaulding's "History of the
Introduction of Scutellaria"
(1819).*

¹ *Materia Medica Americana*, 1785.
² Dr. Lawrence Van Derveer lived in Roysfield, Hillsborough, New Jersey. He graduated from Rutgers College, New Jersey, in 1761, and afterward studied medicine. He moved to Berdstown, Berkeley County, practiced medicine for a time, then returned to his home, where, in his old home, he died November, 1815. He made no record of any having used *Scutellaria*.

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average of ten a year), with but one death. Nor need we look with suspicion upon the large number of cases of hydrophobia said to have been treated by Dr. Van Derveer. Statistics from the most reliable sources show that hydrophobia was either very common³ a century ago, or the *scare* over it widely disseminate. The disease is one demanding *immediate medication*. No risk of time, remedy, or physician will be taken by any one, and it is likely that each person bitten by a questionable dog, and knowing Dr. Van Derveer's reputation in treating the disease, would have made every effort to secure his personal services. The rule of seeking a therapeutic expert holds good to-day. Almost as we write, two persons recently bitten by a mad dog in Florence,⁴ our old home town in Kentucky, went to Chicago to receive authoritative "serum" treatment, both of whom, however, died of hydrophobia.⁵ Let us now revert to the literature connecting *Scutellaria* with this disease.

Scutellaria in Hydrophobia.—In 1812, Dr. James Thacher⁶ issued a book of 301 pages titled:

"Observations on Hydrophobia, produced by the bite of a mad dog or other rabid animal, with an examination of the various theories and methods of cure existing at the present day, and an inquiry into the merit of Specific Remedies. Also a Method of Treatment best adapted to the Brute Creation."

³Like "Milk Sickness" perhaps, which has nearly disappeared where once very common. In our early life in Kentucky we continually heard of mad dog deaths, and knew of frequent rabies in our neighborhood.

⁴Renowned now as "Stringtown on the Pike."

⁵Both of these men, as stated, died of hydrophobia; one a dentist of Florence, Kentucky, the other a negro. Since the record is that of 400 patients treated by Van Derveer, and 590 in all reported as having taken the *Scutellaria* treatment, but one of whom died, the herbalist empiricist of a century ago seems to have held his own with the serum scientist of to-day. The record of the Florence, Kentucky, cases as furnished me by Dr. Corey, the attending physician, is as follows:

A CASE OF HYDROPHOBIA.—About five miles from Florence, Kentucky, a dog attacked by hydrophobia broke from his owner and started towards the village. On the way he met a negro whom he bit over the right eye, the wound being deep, reaching the bone. His wounds were at once cauterized, and the negro taken to Chicago, where with Dr. Tagorlo, on the 8th of December, 1907, he commenced the Pasteur cure. He died on the 30th of December.

The dog on reaching Florence met our dentist (Dr. Marshall), and attacked him. The man was bitten in the face, one wound over the right eye into the bone, another under the right eye one inch in length, a third through the upper lip an inch to the right of the nose, and a fourth at the lower left corner of the mouth which was torn in a semi-circle of about one inch. The wounds were at once washed by me with B. C. M. and stitched. The man immediately started for Chicago, and the second morning after the injury went under the Pasteur treatment with Dr. Tagorlo, remaining under his care and treatment from the 5th of December until his death, which occurred on the 23d.

The head of the dog was removed, and I took it to Chicago with me. After an examination of same, Dr. Tagorlo stated that it was a typical case of rabies.

* The treatment in each case was the Pasteur treatment, with which the profession is familiar.—W. M. COREY, M. D., Florence, Ky.

⁶James Thacher, M. D., American physician, author, and medical historian, was born in Barnstable, Mass., February 14, 1754. After a long and eventful life of 60 years, he died at

SCUTELLARIA.

The frontispiece consisted of the illustration of *Scutellaria Lateriflora*, reproduced as our frontispiece.

In this book, Dr. Thacher considers in detail the history and pathology of the disease as well as the various theories that have prevailed concerning its origin and distribution, together with discussions from such eminent authorities as Boerhaave, Hunter, Darwin, Rush, Cullen, Physick, Coxe, etc. These were analytical and discursive, involving the cause, progress of the disease and treatment. But, although very interesting, they are not relevant to the subject of our present treatise.

Chapters XIII and XIV of Thacher's book deal with the many hydrophobia nostrum cures that have been celebrated both popularly and in the medical profession, such as "the liver of the mad dog broiled," "Cray fish burnt with twigs of bryony," the famous "East India Remedy," "Sir George Cobb's Powder," the famed "Pulvis Antilyssus" of Dr. Mead, the renowned "Omskirk Medicine," and a host of such that had their day and passed into disrepute. Among them, given conspicuity, was "Crous's Remedy," a nostrum so celebrated as to have induced the New York Legislature, 1806, to purchase the formula, for which it paid one thousand dollars;[†] "Webb's Medicine;" and the "Snake Stone," now known as the "Mad Stone." All of these Dr. Thacher passed as worthless, unless the copper salt might have some value, as he suggests (in Crous's Remedy).

Then follow seventeen pages devoted to the record of *Scutellaria*, in which the names of Dr. Van Derveer, "a physician of eminence in New Jersey," and the "Lewis's" use of *Scutellaria* play an impor-

Plymouth, Mass., May 26, 1844. At the outbreak of the American Revolution, Thacher, a young man of 22, was made surgeon's mate to Dr. John Warren and served as such in the general hospital at Cambridge. In 1778 he became chief surgeon to the first Virginia state regiment; and from this position he was transferred to a New England regiment in 1779. In the hospital and medical service during this conflict he rendered signal service, and while thus engaged wrote his celebrated *Military Journal*, which throws much light on the practice and spirit of the times. At the close of the war he located, in 1783, as a physician in Plymouth, where he was also interested in the manufacture of iron and salt. His fame rests upon his writings in medicine and his *Medical Biography*. His "New American Dispensatory" appeared in 1810, and was long an authoritative work on materia medica, medical chemistry, and pharmacy. His historical works, though not of high character nor strictly accurate in all points, are of great value in that they give us much concerning early American medical annals up to 1828, and quite fully reflect the customs and practice of the doctors up to that time. Dr. Thacher wrote "Observations on Hydrophobia," (1812); "The Modern Practice of Physic," (1817, 2d ed., 1826); "The American Orchardist," (1822, 2d ed., 1825); "A Military Journal during the Revolutionary War," (1823, 3d ed., Hartford, 1854); "American Medical Biography," (2 vols., 8 vo., 1828); "Practical Treatise of the Management of Bees," (1829); "An Essay on Demonology, Ghosts, Apparitions and Popular Superstitions," (1831); and "History of the Town of Plymouth," (1832, 2d ed., 1835).—FELTER.

[†] This was found to be: Jawbone of a dog, bruised and powdered, one ounce; false issue of a newly-foaled colt, dried and powdered, one ounce; verdigris on an old copper coin (coinage of George I or II preferred), one scruple. Mix the ingredients, and give a tea-spoonful at a dose.

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tant part. Out of a great many cases but one failure was reported, that of a Dr. Bartlett, who began the use of the drug eight or ten days after several animals were bitten, six of which died of hydrophobia. This lapse of time led Dr. Thacher to say:

"The facts offered by Dr. Bartlett, although deserving of serious consideration, are not to be accounted sufficient to countervail the copious mass of evidence from unquestionable sources, which has been exhibited."

In summing up, Dr. Thacher, who had condemned all other remedies and all the so-called "cures," writes of *Scutellaria*:

"Since the plant is not known to possess properties inimical to the constitution, it merits the most persevering examination and trial in every instance, either in the human subject or brute creation. Every consideration therefore conspires to urge the employment of this article, and the result of every experiment ought to be promptly promulgated."

From this date to 1819 *Scutellaria* commanded much attention, both in the press and by the medical profession of the Eastern States.

Except to the casual student, however, its remarkable record has been completely lost, in consequence of which we again bring it to the attention of the profession.

In tracing the history of this drug, we find that, September 14th, 1819, Lyman Spalding, M. D., read a lengthy and detailed paper before the New York Historical Society on the "History and Use of *Scutellaria Lateriflora* in Hydrophobia,"⁸ soon after published in a pamphlet of thirty pages, carrying the illustration of Dr. Thacher, (see page 3) as its frontispiece. From this we shall now both extract and abstract as a part of our historical study the reported record of this drug in this most fearful disease.⁹

After giving Dr. Van Derveer credit for being

"The first person, so far as we have been able to learn, who used *Scutellaria* as a preventive of hydrophobia from the bite of rabid animals,"

Dr. Spalding in the following language disposes of the charges as to the secret nature of the drug as concerns Doctor Van Derveer:

"On a reference to the many nostrums which have been celebrated for preventing hydrophobia, we do not find that *Scutellaria* had been used either in

⁸ "A History of the Introduction and Use of *Scutellaria Lateriflora* (Scullcap), as a Remedy for Preventing and Curing Hydrophobia, Occasioned by the Bite of Rabid Animals, with Cases; accompanied with a plate of the plant, by Lyman Spalding, M. D. Read before the New York Historical Society, September 14th, 1819, New York. Printed by William Treadwell, and for sale by Collins & Co., No. 189 Pearl Street, and J. B. Jansen, No. 15 Chatham Street. 1819.

⁹ Drug Treatise No. XVI was held incomplete three years, awaiting the discovery of this pamphlet, for which we searched from 1905 to 1908. It was referred to by authorities, but was lost to literature. We could not do justice to the subject without the original. This pamphlet made a record in that, one hundred years ago, it appeared and was translated as republished in France and other European countries. Subsequently translations were made back into English, and republished in America, credit being given the French translator. Thus commentators in America credited the use of the drug in hydrophobia to Europeans, and in turn had derived their information from Dr. Spalding's pamphlet.

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Virginia, or in any other place, previous to its employment by the doctor. Our inquiries do not lead us to believe that the doctor kept his remedy a profound secret, although he has been accused of it by many; but so much do medical men despise what they consider vulgar specifics, and so little faith do the public place in them, that this remedy for forty years was scarcely known or heard of beyond the doctor's immediate circle of practice. It was from these circumstances that no one had the curiosity to ask this gentlemen how he came by a knowledge of the antidotal powers of Scutellaria. From the upright, unassuming character of Dr. Van Derveer, his correct moral deportment, and regular medical standing, we are led to believe that he would as frankly have communicated the source of his information, as the remedies used.

"Among the many persons to whom he communicated a knowledge of his remedies may be numbered Drs. Morris, Kinney, Little, Henry, and Bloomfield of the Revolutionary Army; Dr. Henry Schenck, Sen. Daniel Lewis, and Dr. Henry Van Derveer."

This, in our opinion, together with the evidence we introduce regarding Lewis (p. 12) and what his son records (p. 8) authoritatively relieves Dr. Van Derveer from the charge of secrecy.

Next comes the statement that Dr. Van Derveer treated over four hundred persons, but two dying, for one of whom Dr. Van Derveer disclaimed responsibility as follows:¹⁰

"Dr. Van Derveer was called to visit a young woman living near Rahway in New Jersey, who had been attended by another physician, and in whom hydrophobic symptoms had so far advanced before Dr. Van Derveer saw her as in his opinion to preclude all human aid. She took the Scutellaria, but it did not cure the disease. She died rabid. The doctor was of opinion that several persons for whom he prescribed his remedy in the early part of his practice had some of the symptoms of hydrophobia, and that they were removed by a free use of the plant."

Comes now the ever suggestive question of whether the Scutellaria effected a cure, or whether the animals and people would have recovered without it. This problem is disposed of somewhat after the physiological methods employed in the present day to determine a drug's curative value, excepting that instead of injecting animals in health to obtain a standard in disease expression, Dr. Van Derveer's process, as well as the method of others, was to medicate afflicted creatures and contrast them with the results noted in a similar number of animals not medicated.

For Example. The physiological prover of to-day inoculates an animal in health with a given remedy, to determine the potency of that drug with a human being afflicted by disease. Dr. Van Derveer antidoted (treated) animals inoculated with hydrophobia poison, to determine whether the remedy could cure the afflicted

¹⁰Thacher accepts this estimate because he states in his Dispensatory that ~~one~~ died out of four hundred treated.

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animals, or could abort or counteract (neutralize) the virus, providing it had not begun its action. He reasoned that if a substance (mad dog virus) killed a number of animals inoculated with it, either by the bite of a rabid animal or by injection, the virus was a poison. If a number of bitten animals were not medicated and died, whilst others inoculated in the same way, at the same time, and then treated with *Scutellaria* recovered, he argued that the drug antidoted the poison."

Let us quote from Dr. Spalding:

"Dr. Van Derveer made more than an hundred experiments on the antidotal powers of the scullcap, in each of which the remedy was given to a part of the bitten animals, none of which were afflicted with hydrophobia; but in every instance some of the animals which did not take the scullcap died rabid."

Concerning the number treated, we have it from his son, Dr. Henry Van Derveer, in a letter to Dr. Spalding. Says the doctor:

"It is impossible to determine to what number of animals my father gave the scullcap. I should, however, say that it was not less than one thousand, and in no instance has an animal to which he gave the plant died of hydrophobia. In more than an hundred cases my father experimented with the *Scutellaria*, and he has repeatedly told his medical brethren that each experiment was successful, and tended to establish the antidotal powers of the plant."

And now, having reproduced the essentials concerning the introduction of *Scutellaria*, its application in a historical sense, and the proving method, we shall briefly give a few abstracts to illustrate the manner in which evidence was established a century ago to demonstrate the drug's antidotal power. In all cases the most detailed information, such as dates, localities, authorities, publications, etc., were recorded, as well as the testimony of witnesses under oath.

By Dr. Henry Schenck, Shannock Hills, New Jersey.—"In the year 1777, two black persons and five hogs belonging to Mr. James Van Derveer, of that county, were bitten by a mad dog. Dr. Van Derveer prescribed the *Scutellaria*, which was administered by our informant to the two blacks and to four of the hogs, neither of which had any symptoms of hydrophobia; but the fifth hog, which was the least injured, and which did not take the plant, died in a rabid state about the 19th day after the accident. This experiment, made for the express purpose of testing the antidotal powers of the scullcap, was witnessed by Drs. Morris, Kinney, Little, Henry, and Bloomfield, who considered it as having been satisfactorily conducted."

By Dr. Henry Van Derveer and Dr. John Vancleve, of Princeton, New Jersey.—"About the year 1814, seven cattle belonging to George Schenk, Reding-

11 We are thus careful to give details because the question will arise as to whether the persons would have recovered *regardless* of the drug. This questioning will probably be pronounced in some persons who are saddists of the most intense type concerning the "science" of establishing a remedy for curing disease in man by drug experimentation on animals in health, and who accept without a touch of skepticism some very curious statements of "authority."

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ton, Hunderdon County, New Jersey, were bitten by a mad dog. The scullcap was given to six of them, neither of which had any indisposition, but the seventh which did not take the plant died of hydrophobia three or four weeks after it was bitten."

Of seven cattle bitten by a mad dog, in six treated no indication of hydrophobia appeared. The one not treated died of rabies.

Dr. Thomas Steel, formerly surgeon in the British army, used *Scutellaria* with success.

Dr. Henry Van Derveer, who succeeded his father, reports as follows:

"Seven persons were bitten by a puppy that showed indications of hydrophobia. Six were put in charge of a physician, treated with *Scutellaria*, and recovered. The seventh did not take treatment, and died fourteen days afterward of hydrophobia.

"Three persons (in one family) and two cows were bitten. Two persons came at once to *Dr. Van Derveer*, took *Scutellaria* treatment immediately, and recovered. The third went to another physician, in seventeen days was stricken with symptoms of hydrophobia, and sent for *Dr. Van Derveer*, who at once administered 'a very strong infusion of *Scutellaria*, which the patient drank in as large quantities as his stomach would retain. In thirty-six hours all symptoms vanished.' Both the cows died.

"A man, two hogs, and two cattle were bitten by a mad dog. *Scutellaria* was given the man and one hog. Both recovered. The other animals died of hydrophobia.

A negro girl, four hogs, and a cow were bitten. *Scutellaria* was given the girl, who had no indication of the disease. The animals all died of hydrophobia."

*By Mr. Lewis, North Castle, New York.*¹²—"A number of hogs that had been bitten by a mad dog were divided into two groups. To one group *Scutellaria* was administered. All recovered. The others all died."

Another report is as follows: "Stephen W. Williams, M. D., and his father, both of Deerfield, Mass., have prescribed the *Scutellaria* for about thirty persons, and for forty or fifty brutes which had been bitten, and in no instance did hydrophobia appear. In the doctor's letter to me of the 13th of August, 1819, he says: 'A Mr. Williams, of Heath, in this county, had, in the autumn of 1813, a valuable cow and an ox bitten at the same time by a mad fox. He applied to us for the *Scutellaria*. We had only enough for one animal. He prized his cow more highly than his ox, and was very anxious to save her. He therefore gave the whole of the scullcap to his cow, and suffered the ox to take his chance without any medicament. The ox died, exhibiting the aggravated symptoms of hydrophobia, while the cow had no indisposition.'"

Statements in the press, in magazines, by authorities unimpeachable, finally became so abundant in support of *Scutellaria* in hydrophobia as, if the disease was authentic, to seem incontrovertible.

Failures.—As recorded by Spalding but one man, *Dr. Thacher*, reports a failure¹³ with the *Scutellaria* antidote. He says:

"A child bitten was faithfully dosed with the infusion twice daily, but died on the 30th day."—(*New York Medical Repository*, New Series, Vol. I, p. 175.)

¹² Mr. Lewis obtained the formula from *Dr. Van Derveer*. See page 12.

¹³ See note, page 7.

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Reported by Lewis Bartlett to Dr. Thacher (Thacher on Hydrophobia, 1812), "Nine hogs were bitten by a mad dog, treated with Scutellaria, six died."

These are the only cases of failures reported by Dr. Spalding out of more than 850 persons, and a large number of animals treated with Scutellaria.

As showing the symptoms of the afflicted patients and the rabid animals, we reproduce two typical reports:

Report of Dr. Fisk of Massachusetts.—"Mrs. H—, belonging to this town, of a healthy constitution, twenty-four years of age, was bitten on the 5th day of July last by a puppy four months old, supposed by herself and her friends to be mad. The following were the marks he showed of rabies: On Saturday, the 3d, he refused his accustomed food, appeared stupid and sickly, head and ears hanging down, and showed no disposition for playfulness. On the 4th, still refused to eat, his eyes were red, dull and full of tears, and his mouth covered with apparently tough and frothy slime; he frequently staggered and fell down, sometimes started up quick and attempted to run, but could not get straight forward; took little notice of anything; towards evening snapped at objects, but never barked. On Monday morning he became furious, ran at everything that came his way, and attempted to bite; at length actually did bite the lady above mentioned on the ball of the thumb, making four incisions through the skin. He was then immediately killed. On the same day she sent for me, and I advised the immediate use of the sculcap, but not having any on hand, I was only able to procure some of another person, which had been gathered two years before, and had lain exposed to the open air in a box, with directions to give it every other day, as prescribed by Dr. Thacher. She did so, and the wound healed in a few days with no unpleasant symptoms. But on the fifteenth day after the bite she felt a slight pain or itching in the part bitten, which soon became a little elevated, and a circumscribed inflamed spot, about the size of a sixpence, arose and extended over the cicatrix of one of the marks of the dog's teeth; soon afterwards she felt a fixed pain in the wrist which extended to her elbow, and shortly increased and reached to her shoulder; wandering pains in her back and joints succeeded; she felt a painful and strange sensation in her head, and sometimes also a giddiness, so that she could not walk straight forwards; she now complained of lassitude, with stricture and heaviness in her breast, accompanied with difficulty of breathing. On perceiving these alarming symptoms, I concluded that the plant had lost its virtues by age and exposure, and endeavored to procure some of recent growth, which fortunately I obtained, and in blossom; of this I ordered a strong decoction to be taken immediately, in doses of half a pint each, four times a day, to be suspended every other day, and a tablespoonful of flowers of sulphur in new milk to be taken in its stead. For the greater precaution I also punctured the bitten part, which discharged a little watery fluid, and applied to it the bruised leaves of the plant, which I renewed once every four or six hours. On the 16th day symptoms were but little abated and her pulse somewhat depressed, but she had slept more quietly. The 17th, the pain, excepting in her wrist and head, had subsided, the bite had lost its redness, and she had slept still better. On the 18th she said she felt quite well, excepting a little weakness. She kept the application on the wound two days longer, when it healed, and she left it off, but continued to take the decoction, though with diminished strength, three weeks longer, but

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has experienced no pain or unpleasant sensation since the 18th day, enjoying her usual good health and going about her domestic labors as formerly." —SPALDING.

Report of Dr. Robson, New York *Evening Post*, July 16, 1819:

"Early on Thursday morning, the 10th of June, I was called upon by James Cann, who requested me to dress his right hand, which had just been bitten by a dog, which he believed was mad. Upon examination I found the dog's teeth had penetrated deep into the muscular part of the thumb, between its metacarpal bone and that of the forefinger, and that the skin was but little lacerated. From the situation and depth of the wound I deemed extirpation inexpedient, and directed superficial dressings.

Thursday, the 17th. About noon he was suddenly taken ill, and sent for me. I found him laboring under frightful spasms of the muscles of the face and neck; his face was drawn towards the right shoulder, his head convulsively shaken, he ground his teeth with violence, his eyes had a wild and terrific stare, and his whole aspect was appalling; but the spasms soon subsided, and he became perfectly calm. Upon inquiry I found he was first attacked with a shivering, then a pricking or tingling sensation about the parts bitten, extending over the hand and running up the arm, accompanied with slight involuntary twitchings of the muscles of the hand and arm; to these succeeded a sense of tightness about the chest and throat, immediately after which followed the convulsive action of the muscles of the face and neck, above described. I found his pulse and breathing regular and natural during the intervals; but when the paroxysms were approaching they became hurried and irregular, and continued so until the spasms had gone off, when he complained of slight pain in the right breast, together with a soreness and stiffness of the back part of the neck. Liquids he took without difficulty, nor did pouring water from one vessel to another in his presence produce any perceptible distress; neither did the sight of the surface of a polished mirror, or the waving of a white curtain, sensibly affect him. His paroxysms returned at irregular intervals of from five to ten minutes, their duration being from one to two minutes.

18th. He had taken largely of his tea and thought himself better; the spasms, however, still severe, but not quite so frequent.

19th. This morning we found him cheerful; he had passed a tolerably good night; feels much better than yesterday; his spasms moderating considerably, both in violence and frequency. He still continued his tea as before. In the afternoon a shower of rain fell, at sight of which, and the rippling of the water in the gutter, his spasms returned in quick succession, and with more violence than they had done at any other time during the day.

21st. He said he felt like a new man; his spasms had nearly left him; still continued in the use of his tea as before.

22d. He had no spasms, nor did he complain of anything but weakness. We directed him to continue in the use of the scullcap three or four weeks longer."

The dog that bit this man was securely confined in a cool place, well fed, and treated kindly. He went violently mad, and died snapping at every neighboring object. As a typical case of canine hydrophobia, we reproduce the report verbatim:

"This dog was secured the same day he was bitten, and put in a cool, airy, and dry cellar; he was regularly fed, and continued well until the 6th of July.

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He then began to show symptoms of canine madness; the under jaw fell, his food dropped from his mouth when he attempted to eat; he made many efforts to drink, frequently burying his nose in the water, but did not appear to swallow; he was obedient to his master's commands, was dull and moping, but would occasionally snap at imaginary objects, in the air or on the floor; his eyes were languid and watery, and considerable frothy saliva was discharged from his mouth. In the course of the next day (the 7th), he was much weakened, particularly in the hinder parts, producing slight staggering; his tongue was livid and brown, slimy fluid was observed to run out of his mouth. On the 8th, he would snap at his chain, or any object that touched him; was thirsty, and lapped water very frequently, without being able to swallow any; his tongue was darker, and his debility increased rapidly; he would not eat, and staggered very much when he attempted to walk.

9th. The dog appeared much weaker; seldom got up, except by compulsion, and soon fell down again. He appeared blind in his right eye, his back much curved.

10th. He was unable to stand; had spasmodic twitchings of all his muscles; would yet snap at any object that touched him; towards evening he grew worse, and died sometime in the night."

Dr. Spalding sums the whole subject up as follows:

"We have then the foregoing testimony that the scutellaria has been used by more than eight hundred and fifty persons, bitten by animals believed to be rabid; and in only three instances¹⁴ have symptoms supposed to be hydrophobic supervened, and in each of these cases the quantity of the plant actually taken was very inconsiderable. In two of them the symptoms disappeared on taking more freely of the medicine.

"Furthermore, the Scutellaria is said to have been administered to more than eleven hundred brutes, bitten by animals supposed to be rabid, and in no instance have any symptoms of madness appeared, excepting in the cases communicated by Dr. Bartlett.

"In more than one hundred instances it is said that experiments have been made to test the antidotal powers of this plant by giving it only to a part of the animals bitten, and it is stated that in every experiment those animals which did not take the Scutellaria have died rabid; but in no instance have any of those which took it had any indisposition."

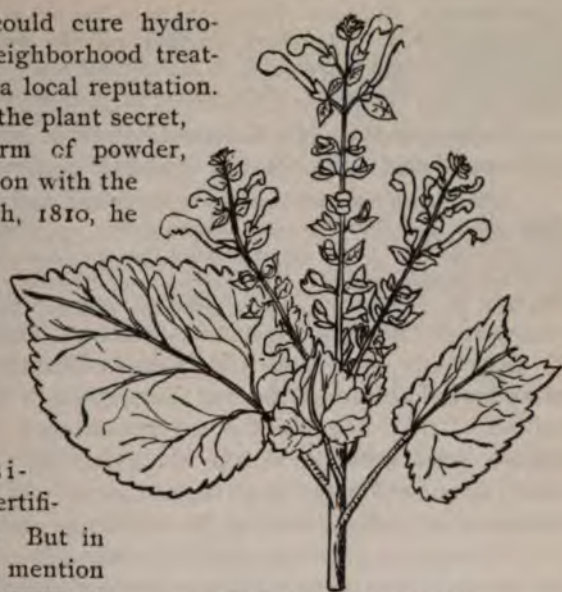
Scutellaria as a Secret Remedy.—Now came the popular, or newspaper, era of the drug. In the year 1783 Mr. Daniel Lewis, of North Castle, New York, by occupation a weaver, was bitten by a mad dog. He went to New York for treatment, and was directed to Dr. Van Derveer of New Jersey. Dr. Van Derveer showed Mr. Lewis the plant, and by giving him written directions, taught him how to use it. Mr. Lewis recovered, and having the formula, next told his

¹⁴ "Mr. Coleman has repeatedly called on the public to communicate to him a single well attested case of the failure of the scutellaria; but no such case has yet appeared."—*Spalding*.

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neighbors that he could cure hydrophobia, and began neighborhood treatment, acquiring thus a local reputation. He kept the name of the plant secret, using it only in form of powder, acquainting only his son with the formula. At his death, 1810, he had treated successfully about one hundred persons. A record of these cases is given by Dr. Spalding, accompanied by names, dates, places of residence, and often by certificates from witnesses. But in it all, seemingly, no mention was made of the treatment being identical with that of

Dr. Van Derveer, from whom it was obtained, and who, as is recorded, did not make any secret of the name of the herb, giving it freely to whoever asked for it.



SCUTELLARIA VERSICOLOR.

(From American Dispensatory, Vol. II, 1900.)

Before the death of Lewis, the elder, the "Lewis Secret Cure" for hydrophobia became celebrated far and near, and it also became known to some persons that the remedy employed was identical with that of Dr. Van Derveer.

Scutellaria, about 1809, came into popular as well as newspaper notoriety as a cure for hydrophobia, one of the first notices in print we find being a letter to Mr. Robert Bowne, a celebrated philanthropist of New York City, published in the *Salem Gazette*, September 15th, 1809. The writer credits the Lewises with the secret cure, and states that the drug has been proven to be Scutellaria, the identification being made as follows:

"The remedy he made use of is nothing more than a plant that grows in the fresh meadows of our country. The botanic name of it is *Scutellaria*



SCUTELLARIA LATERIFLORA.

(From American Dispensatory,
Vol. II, 1900.)

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Galericulata.¹⁵ This plant Lewis used to gather, dry it, and reduce it to a powder, in order to prevent a discovery of what it actually was. It was found out by a person who obtained some of it in a powdered state; observing seeds in it, he placed them in his garden, where they came to perfection."

Following this, Mr. Coleman, editor of the New York *Evening Post*, published corroborative editorial testimony to the effect that

"He himself had been witness of the cure of hydrophobia by the use of this plant alone, and that there are a number of gentlemen of the most respectable characters in New York, who will attest that they have been witnesses of repeated cures by the same remedy. He also confirms the account given in the above letter. The Rev. Dr. Cutler¹⁶ also has received verbal information, which he considers as confirmatory of the above important particulars."—THACHER.

Reference is made to these facts in Thacher's New Dispensatory, 1810, long descriptions thereof being given in detail. In the revised edition of 1821, Dr. Thacher, after making his special study of the disease, condenses the article, abandons the verbatim reproductions from the current press, but emphasizes the value of Scutellaria in the treatment of hydrophobia, in the following positive language:

"The medical properties ascribed to scull-cap are those of an antidote against the effects of *canine madness*. In a publication entitled, *Observations on Hydrophobia*, by the compiler of this work, a mass of evidence in favor of the antidotal powers of this plant has been recorded.¹⁷ Numerous gazettes and journals have also teemed with ecomiums on its preventive powers, and from sources so respectable as to claim attention and confidence; and where it has been most known and employed, it has been the most highly extolled. Dr. Van Derveer, late of New Jersey, being in possession of the secret, acquired extensive popularity by his success; and he is said to have declared, that during his practice he has prevented upwards of three hundred persons from going mad, and that he never lost but one patient to whom his medicine had been administered. *From the high reputation, therefore, of scull-cap, perhaps surpassing that of any other remedy, practitioners ought to resort to the use of it on any occasion which may offer, either in relieving mankind from this awful malady, or in arresting the devastation among the brute creation.*"

Treatment.—The following is the manner in which Mr. Lewis and Dr. Van Derveer respectively prepared and administered the remedy:

"The leaves (of Scutellaria) should be gathered when in flower, carefully dried, reduced to a fine powder, and put into bottles, well corked, for use. When a person has received a bite by a mad dog, he must take of a strong infusion of the leaves or powder, a gill four or five times a day, every other day. The day it is omitted he must take a spoonful of the flowers of sulphur in molasses, in the morning fasting, and at bedtime in new milk, and apply the pounded green herb to the wound every two hours, continuing the prescription for three weeks. For cattle or horses, use four times the quantity prescribed for a man."—THACHER.

¹⁵ This was an error. The plant was *Scutellaria Lateriflora*.

¹⁶ Manasseh Cutler.

¹⁷ *Observations on Hydrophobia*, 1812.

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The Discrediting of Scutellaria.—Between the date of its discovery, in 1773, by Dr. Van Derveer, who experienced nearly half a century of quiet, neighborhood practice of medicine, and the charlatanism methods of the weaver Lewis, who knew nothing of medicine, but was an advertising "*mad-dog doctor*," Scutellaria passed into offensive notoriety, several causes uniting to discredit the drug.

First arose the hostility of the leaders of the medical profession because of its newspaper popularity, for, by reason of its popular use by non-medical men, the drug came to be dominated by laymen.

Second, the extravagant claims of enthusiastic empiricists.

Third, the natural questioning of the value of Scutellaria by the medical profession of that period, because it was a kindly substance which in that day of heroics could not be tolerated. A drug that could not kill, they reasoned, could not cure. Much less could a substance that could be given in great draughts, without any harmful effect on a well man, be capable of neutralizing or counteracting so virulent a poison as the virus of hydrophobia.

Thus, under prevailing therapeutic methods and theories, distrust of the remedy was natural, and antagonism to it became inevitable. The leaders of the profession of the date following 1820, neglecting Thacher's advice (see p. 6), either ignored Scutellaria as a remedy for hydrophobia because of its use by quacks, or discredited it because of its mild inoffensiveness. Whether, in the ultimate, this ostracism of the remedy was just or unjust, in the face of all the evidence, has not, in our opinion, been as yet determined. Whether Scutellaria is an invaluable remedy that dropped from sight because of the prejudice of the men ("*skeptics*," they were called by Rafinesque), who opposed the methods of its advocates and refused to test the drug, or was dropped because it has no virtues, is a question that we propose to consider as an open one, in the light of its record, and of what history teaches concerning medical politics in the first half of the 19th century. The scientific C. S. R. Rafinesque, giving a summary of its hydrophobia record, in 1830, expresses the matter about as the evidence appeals to us :

"Many empirics and some enlightened physicians have employed it successfully. But several skeptical physicians have since denied altogether these facts, and pronounced the plant totally inert, *because it has no strong action on the system*, and has failed in their hands. Dr. W. P. C. Barton and Dr. Tully have strenuously asserted this, but without analyzing the plant, and *denying instead of proving*. . . . In hydrophobia it appears to be a good prophylactic, if not a certain cure. A physician (Dr. White, of Fishkill) bitten by a mad dog, has assured me that he alone avoided the disease by using it, while others bitten by the same dog died. Many instances of the same kind are on record: *ray*, many who believe in the property say it never fails. We lack, however, a

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series of scientific and conclusive experiments, made by well-informed men; *they have been discouraged by the ridiculous denial of skeptics*; but let us hope these may yet be performed."—*Rafinesque, Mat. Med. Vol. II, 1830.* (Italics our own.)

It will be observed that the scholarly Rafinesque, who was familiar with all scientific literature to his date, and who refers to such authorities as Tully and Barton, with whom he was intimately acquainted, asserts that the drug had not been given justice, because, to put the matter plainly, the "*skeptics*" forbade. Nor do we find authoritative data between 1830 and 1908 to weaken this statement, or to disprove Scutellaria's virtues.

To Sum Up.—Scutellaria was introduced about one hundred and fifty years ago as a remedy in hydrophobia, enjoying for a half a century a remarkable popular reputation, as well as an authoritative professional record.

It passed into disuse in the very face of the testimony presented by Drs. Thacher and Spalding to the effect that out of more than 850 persons bitten by animals considered rabid (many of which gave rabies to other animals and to persons as well), one only treated with Scutellaria died, although two had been attacked with the disease before treatment was instituted.

It is furthermore recorded that in more than one hundred experiments where bitten animals were separated, all not treated died, whilst in no case was a treated creature affected.

The only contrary evidence is that of one child reported by Dr. Thacher,¹⁸ and the animals of Dr. Lewis Bartlett, who lost six hogs out of nine treated with Scutellaria, but as Dr. Thacher states, eight or ten days had passed before the remedy was used.

In view of all these facts, and in consideration of the death of two out of three persons treated without delay by the now popular serum method (see page 7), were we concerned in a case of possible hydrophobia, we would insist that, until authentic contra-evidence is presented, even though other methods were employed, the Scutellaria treatment be also instituted.

In this connection we call attention to the fact that the Scutellaria cure consists of:

1ST. A very strict process of dieting. (See page 14.)

2D. A course of parallel medication in which sulphur was conspicuous. (See page 14.)

These facts, in our opinion, must not be overlooked; indeed, Scutellaria seems to have been but one of the factors in the course of treatment.

¹⁸ Evidently, from the wording of Dr. Spalding's report, not Dr. James Thacher, whose "Observations on Hydrophobia" appeared in 1812. See Biographical Note, Page 14.)

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Constituents, or Decomposition Products.—As in attempts to locate the structural ultimates of other plants in which a drug as a whole, not the fragment, plays a part, so have the efforts of the chemist failed in *Scutellaria*. In 1824, Cadet made an analysis of the drug, describing, among other usual constituents of plants, a peculiar volatile oil, and a bitter principle which seemed to be peculiar to the drug. In 1887, Howard decided that the volatile oil was the characteristic principle, but this exists in very minute amount. In 1889, Myers and Gillespie obtained the usual drug products, and also, in the form of stellar crystals, a decided amount of Cadet's bitter substance, which proved to be a glucoside.

To sum it all up, in our opinion these chemists severally destroyed the plant, and from the products of disintegration obtained certain ultimates that may or may not exist in the plant tissue, and, likewise, may or may not, singly or collectively, have any decided therapeutical connection with the drug's structural qualities.

Pharmaceutical Preparations.—The Pharmacopœia of the United States recognizes the Fluid Extract of *Scutellaria*. The early users of the drug employed infusions, decoctions and tinctures, simple or compound. In Eclectic practice the Specific Medicine is the standard preparation. It is an alcoholic preparation, representing the herb minim to grain.

THERAPEUTIC RECORD.

History.—Schoepf,¹⁹ 1785 (*Materia Medica Americana*), states that *Scutellaria* is useful in fevers, B. S. Barton, 1798. (Collections for a *Materia Medica*), Zollicoffer, Eberle, Dunglison, Ewing, and other authors in *materia medica* and practice the first part of the nineteenth century, neglect it. Porcher, 1849 (*Indigenous Medicinal Plants of North Carolina*), cites previous references, commenting on the reputation Youatt ascribed to the drug in hydrophobia. This he repeats in his "Resources of the Southern Fields and Forests." Clapp, 1850-51 (*Medicinal Plants of the United States*), refers to Youatt, but states that "in his able treatise on canine rabies, it (*Scutellaria*) is not even mentioned," although he "had some faith in it for a while." The United States Dispensatory, first edition, 1833, makes no mention of *Scutellaria*, but the second edition, 1834, refers to it passingly as follows:

"To the senses it does not indicate, by any peculiar taste or smell, the possession of remarkable medicinal virtues. It is even destitute of the aromatic

¹⁹See Biographical Note, page 3, Drug Treatise Number XIII, (Macrotys.)

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properties which are found in many of the labiate plants. When taken internally, it produces no obvious effects upon the system. Notwithstanding this apparent inertness it obtained, at one period, extraordinary credit throughout the United States as a preventive of hydrophobia, and was even thought to be useful in the disease itself. A strong infusion of the plant was given in the dose of a teacupful, repeated several times a day, and continued for three or four months after the bite was received; while the herb itself was applied to the wound. Strong testimony has been adduced in favor of its prophylactic powers; but it has already shared the fate, which in this case is no doubt deserved, of numerous other specifics against hydrophobia, which have been brought into temporary popularity, only to be speedily abandoned."—*United States Dispensatory*, 1834.

This in the current edition (1907), without any proof for or against the drug, other than apparent neglect, is contracted to:

"Scullcap is as destitute of medicinal properties as a plant may well be, not even being aromatic. When taken internally, it produces no very obvious effects, and probably is of no remedial value, although at one time it was esteemed as a remedy in hydrophobia."

The National Dispensatory, which evidently bases its views on the drug's lack of poisonous qualities, pessimistically supports the above as follows:

"Scutellaria is devoid of properties which entitle it to be classed among official drugs."—*National Dispensatory*, 1907.

Notwithstanding this, the Pharmacopœia of the United States, even to the 1900 revision, gives Scutellaria a position.

Neither W. P. C. Barton or Tully gave the drug respectful attention. Rafinesque, 1830 (*Medical Flora*), gives its analysis by Cadet, (see page 17), makes a synopsis of the claims made for it in hydrophobia (see page 15), adds thereto the testimony of Dr. White, and in the following forceful language criticises the medical profession for neglecting to intelligently and fairly test its virtues:

"We lack, however, a series of scientific and conclusive experiments, made by well-informed men; they have been discouraged by the ridiculous denial of skeptics."

This criticism stands unimpeached to-day (1908), so far as we can discover, for we find no evidence of fact to show that any investigation by these pessimistic or prejudiced critics has ever been authoritatively made, either to disprove or support the evidence presented by the advocates of its claims (see preceding pages).

Therapeutic Uses.—Then came Dr. John King, who in the first edition of his *Eclectic Dispensatory*, 1852, ascribed to Scutellaria the following properties:

SCUTELLARIA.

"Tonic, nervine, and antispasmodic. This is one of those valuable agents which a certain class of physicians²¹ consider inert; yet has proved especially useful in chorea, convulsions, tremors, intermittent fevers, neuralgia, and all nervous affections. In delirium tremens, an infusion drunk freely will soon produce a calm sleep. In intermittents, it may be beneficially combined with lycopus. Where teething has impaired the health of children, an infusion may be given with advantage. In all cases of nervous excitability, restlessness, or wakefulness, attending acute or chronic disease, or from other causes, it may be drunk freely with every expectation of beneficial results. It has also a tendency to keep the skin moist. It has been extolled in hydrophobia, but this is still a matter of uncertainty."

In this article of Dr. King we have a summary of the scope of the drug and its qualities, more complete and intelligent than can be found in all other medical authorities, to this date, combined. And although King states that the value of *Scutellaria* in hydrophobia is "still a matter of uncertainty," the drug influence given by him is such as to strongly suggest its application in that as yet neglected direction.

In 1887, Millspaugh, in his "American Medicinal Plants," asks that respectful attention be given to its anti-hydrophobic claims, as follows:

"The natural order *Labiatae* yields species of many of its genera that are valued by the aborigines of countries in which they grow as anti-hydrophobics. Some value should at least be considered under these circumstances, as native medication is always the result of long and more or less successful experiment.

"The plant has proved itself a useful antispasmodic, nervine, and tonic in chorea, convulsions, tetanus, tremors, delirium tremens, wakefulness in chronic disorders, and many other diseases when a tonic combining nervine powers might be deemed necessary; it is also considered diaphoretic and diuretic."

In Specific Medication Dr. Scudder very conservatively presents his opinion, not only of the therapeutic side of the remedy, but of its pharmacy, as follows:

"We have here another remedy that loses its medicinal properties by drying, until by age they are entirely dissipated. I have seen specimens furnished physicians by the drug trade that were wholly worthless; no wonder they were disappointed in its action.

"The *Scutellaria* exerts a direct influence upon the cerebro-spinal centers, controlling irritation. It is possible that it may also exert a tonic influence, favoring nutrition. It has been employed with success in chorea, convulsions, epilepsy, mania, etc., and especially in hysteria, monomania, and that undefined condition that we call 'nervousness.' I value the remedy highly, but recommend it only when prepared from the fresh plant."

²¹ Referring to physicians who consider only poisons to be medicines.

SCUTELLARIA.

SPECIFIC USES.

Description.—Specific Medicine Scutellaria is a good type of the remedy once known as the nervine. It influences the cerebro-spinal centers, controlling nervous irritation, as shown by its control over functional heart disorders, due wholly to nervous causes, with intermittent pulse and palpitation. There may also be hysterical manifestations. It may be employed with benefit in cases of nervous excitability, restlessness, or insomnia, attending or following acute or chronic disease, or from physical exhaustion or mental overexertion, teething, etc. It is also indicated in nervousness shown in muscular movements, as tremors, etc.

Dose.—Sp. Med. Scutellaria, gtt. v. to gtt. x. every hour or oftener as the case demands.

PRICES OF SCUTELLARIA PREPARATIONS.

Specific Medicine.

¼ lb. package, ...	50c. each.	By mail, 72c. each.
½ lb. package, ...	95c. each.	Not mailable.
1 lb. package, ...	\$1.80 each.	Not mailable.

For Sale by Pharmacists generally and by all Wholesale
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LLOYD BROTHERS,
CINCINNATI, OHIO.

JULY, 1908.

ACUTE POISONING.

Emergency Directions for the Management and Treatment of Overdoses of Energetic Drugs, Mostly of Botanic Origin.

BY HARVEY WICKES FELTER, M. D., Cincinnati, Ohio.

(From the *Eclectic Medical Gleaner*, May, 1908.)

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ACUTE POISONING.

THE MANAGEMENT OF ACUTE POISONING.—Without going into detail in the matter of the definition and classification of poisons, nor to any extent into the symptoms produced by them, nor into toxicological analysis, we purpose to offer a few practical notes concerning the antidoting and treatment of acute poisoning by the energetic drugs most largely employed in the Eclectic practice of medicine. It is not easy, nor is it practicable, for the physician to hold in his memory the antidotes and necessary procedures for all the poisons one may meet nowadays. While he can and should carry in his pocket a brief memorandum, most of such aids known to the writer are antiquated and of little practical value. The doctor would do better to compile his own list from authentic sources.

For this paper we have purposely selected a few of the agents most commonly employed by Eclectic physicians, for we are most frequently asked for information concerning these drugs. Some others not so commonly employed by them are also included. It not infrequently happens that an overdose of medicine is unintentionally administered, or that through some circumstance—idiosyncrasy, perhaps—toxic effects result from ordinary or even small doses of energetic medicines. We have several times known small doses of aconite, belladonna, opium, lobelia, and ipecac to produce symptoms that might be regarded as mildly toxic. It is presupposed, in the matters treated of in this paper, that the drug taken and the amount are known. Therefore no space will be taken up in the consideration of discovering the unknown drug.

GENERAL CONSIDERATIONS.—The first consideration in a case of acute poisoning is to get the poison out of the stomach as quickly as possible. At the same time there may be given such agents as are known to combine with or convert the poison into a harmless or, at least, less soluble condition or salt, or to physiologically antagonize its effects. Only substances that will dissolve in the fluids used or in the juices of the stomach will act as poisons. Hence, to render them less soluble or to throw them out of solution is a step always to be taken advantage of. Empty the stomach by the quickest known method.

MEANS.—Emetics head the list of necessities. The quick-acting or irritant emetics are to be selected, except where the gastric membranes are so obtunded as to fail to respond to the emetostimulus, or when narcosis is profound. In such cases apomorphine hydrochlorate (1-8 to 1-10 grain) hypodermically is the most reliable aid. The list of good emetics include:

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Zinc sulphate, the best emetic for internal use; grains 20 to 30 in 2 ounces of water. Children, smaller doses (5 grains); repeat every 10 to 15 minutes until free emesis occurs.

Copper sulphate, grains 10 in 2 ounces of water.

Mustard, one-half to one tablespoonful in a half pint of lukewarm water; follow with plenty of tepid water. A teaspoonful of salt may be added if desired.

Melted fats and *bland oils* are often protective, envelop and retard the action of the poison, and often produce emesis. They have little antidoting power (except in alkali poisoning) and should *not* be used in cases of poisoning by phosphorus, cantharides, or carbolic acid.

With all emetics the patient should be made to drink from a pint to a quart of tepid water, and be encouraged to tickle the soft palate or to press down the base of the tongue with the finger. These are great aids to vomiting and alone may be sufficient to thoroughly empty the stomach.

OTHER EMETICS.—If the above-named emetics are not at hand, use—

Ipecac, powdered, 30 to 40 grains in lukewarm water.

Specific lobelia, one-half to one teaspoonful in warm water.

Compound emetic powder, one to three teaspoonfuls in plenty of warm water. Especially valuable where a stimulating effect is desired.

Acetous emetic tincture, one to three teaspoonfuls in plenty of warm water.

STIMULANTS.—These are often required in depressive poisoning. The best agents are:

Brandy or whisky, two teaspoonfuls every 10 or 15 minutes, or 30 drops hypodermically, using care not to produce alcoholic poisoning.

Aromatic spirit of ammonia, one teaspoonful every 10 or 15 minutes, or 30 drops hypodermically.

Ether (sulphuric), 15-drop doses hypodermically, repeated as often as necessary to keep up the circulation.

Coffee.—Freshly prepared, strong black coffee freely administered.

Atropine sulphate, 1-100 grain hypodermically, often has a sustaining stimulant action upon the heart.

ANTIDOTES are of two kinds, *chemical* and *physiological*.

Chemical antidotes combine with the poison to form new and harmless or less harmful compounds, or render it insoluble or less

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soluble. Examples: Egg-whites (albumen) for corrosive sublimate; common salt for silver nitrate poisoning.

Physiological antidotes are those which counteract the effect of the poison which has been absorbed. Examples: Belladonna for opium poisoning; stimulants in nerve-depressing poisons; coffee in opium narcosis.

Sometimes both chemical and physiological actions are exerted by the same antidote.

THE STOMACH PUMP.—This should be used where emesis is not easily accomplished. It should not, except rarely, be used where the membranes are destructively corroded or softened by the poison.

LENITIVES AND AFTER-TREATMENT.—Among the best lenitives for after-treatment are mucilages of starch, slippery elm, or acacia, albumen, milk, flaxseed tea, flour and water, oatmeal gruel, etc., and liquor bismuth and bismuth subnitrate. If these do not relieve irritation or pain, opiates, or hyoscyamus, or similar agents may be cautiously employed.

Acetanilid (and other coal-tar antipyretics).—Recumbent posture; stomach pump or emetic of mustard or zinc sulphate. Stimulate with aromatic spirit of ammonia, ether, brandy, or whisky. Give strychnine, 1-30 grain, to effect, and atropine sulphate to sustain arterial pressure. Artificial heat and forced respiration.

Acid, carbolic. Give freely of whisky, or dilute alcohol (cupful of alcohol and water, equal parts) and sulphate of magnesium (Epsom salts), or sulphate of sodium (Glauber's salt). Administer also diluted vinegar. Soapsuds, albumen, and mucilages retard the action of carbolic acid. Employ stomach pump at once, and repeatedly wash out the stomach. If pump is not at hand, give hypodermic of apomorphine hydrochlorate, 1-10 grain. If no other means of emesis is at hand, use mustard.

Acids, Corrosive (Nitric, Hydrochloric, and Sulphuric).—Neutralize with alkaline substances, as lime water, soda solution, soapsuds, plaster from wall, oxide of magnesia. Use plenty of water and employ stomach tube. Avoid the use of the emetic if possible, for, if stomach is much corroded, the action is liable to rupture it; hence the preference for the stomach pump, or trusting to the results of chemical neutralization.

Aconite. Insist on recumbent posture, with head lower than the feet. Use stomach pump if possible. Emetics act poorly; if used, select mustard in plenty of warm water. Give strong tea and coffee. Use artificial respiration if breathing flags. Use stim-

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ulants, ether, brandy, aromatic spirits of ammonia, atropine sulphate. Maintain quiet as much as possible.

Æsculus. Use emetic of mustard or zinc sulphate or stomach pump. Stimulate freely.

Alcohol. Siphon out stomach, or give an emetic of mustard or zinc sulphate. Provide plenty of fresh air, and give ammonium chloride, 30 grains in half pint of warm water. Apply heat to body, and support the heart with strychnine nitrate, 1-30 grain, hypodermically. Inhalations of aqua ammonia cautiously administered may be of service. If asphyxiated, the electric current may revive. Draw the urine.

Alkalies. Neutralize with diluted vinegar, lemon or orange juice, or citric or tartaric acid, well diluted. Or convert into soaps by the use of bland oils or fats—melted lard, cottonseed or olive or sweet oil. Avoid emetics if stomach pump can be used, lest the softened stomach membranes become ruptured by the act of emesis.

Alkaloids. For this class of salts the following have been repeatedly recommended as valuable antagonists: Tannin, by reason of forming insoluble tannates with alkaloids; permanganate of potassium for morphine and strychnine; and animal charcoal, iodine, and albumen. Emetics are usually needed, and cathartics in some cases.

Belladonna. Stomach pump or emetic of mustard, zinc sulphate, or ipecac, or apomorphine hypodermically. Keep patient in motion. Small doses of opium, morphine, or muscarine are physiologically antagonistic. Be governed by action of pupils in antidoting with opium preparations. Pilocarpine nitrate said to be best physiological antagonist. Employ heat to body, stimulate with brandy or ammonia, use artificial respiration, and catheterize to prevent reabsorption of poison from the urine.

Bryonia. Empty the stomach by siphon or emetic, using water copiously. If bowels have not freely moved, purge with Epsom salt or castor oil or demulcent enemata. Give freely of demulcents, stimulate with brandy or whisky, maintain body heat by external warmth, and administer morphine or other opiates to control pain and allay nervous irritability. Hot fomentations to the abdomen.

Cannabis. Stomach pump or emetic of mustard, zinc sulphate, or apomorphine. Give strong tea and coffee. Keep patient in motion and awake. Liberal doses of sweet spirit of nitre to en-

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courage renal action. Catheterize, and give stimulants, particularly small doses of specific belladonna or atropine sulphate.

Cannabis Sativa (American Hemp). Treat same as for Cannabis.

Cantharis. No chemical antidote. Use stomach pump preferably, or emetic of zinc sulphate, or mustard, or ipecac, or apomorphine hypodermically. Give opium to relieve pain, stimulate with brandy. Use artificial heat and demulcent drinks. *Do not use oils.*

Chloral. Recumbent posture, with head lower than feet. Empty stomach with tube. Emetics are debilitating. Give liquor potassæ (2 drachms in half pint of warm water) every hour. Give plenty of strong coffee or tea, and siphon out; or administer them per rectum. Strychnine sulphate 1-30 grain, or picrotoxin 1-60 grain, or amyl nitrate (3 to 5 minim pearl crushed and inhaled), or brandy or whisky. Oxygen by inhalation; also ammonia. Apply cold to head, artificial heat to body, keep patient awake by shaking, flagellation, shouts, or by electricity. Artificial respiration, if breathing is labored.

Chloroform. Press jaw forward, and draw out tongue; use artificial respiration, slap the chest vigorously, forcibly and quickly dilate the rectum. Inject atropine sulphate and strychnine, or nitro-glycerin; employ external heat, and avoid alcohol or ether.

Cocaine. If used hypodermically: Recumbent position, fresh air, artificial respiration, stimulants, and electricity. Brandy, ether, strychnine, atropine, belladonna, nitro-glycerin, or strong coffee may be used as stimulants.

If swallowed: Precède treatment with use of stomach pump or emetic of zinc sulphate, mustard, or ipecac. Give tannic acid or strong tea freely and repeatedly while washing out the stomach. Control convulsive attacks with chloroform or ether.

Colchicum. Empty the stomach with tube or emetic. Give freely of tannic acid or strong tea. Use demulcents, as milk, eggs, mucilages, etc.; employ artificial heat, relieve pain with opiates, and stimulate freely. Hot fomentations to the abdomen are grateful, and the bowels should be evacuated with castor oil.

Colocynth. Treat same as for Bryonia, which see.

Conium. Evacuate stomach by stomach pump or emetic of mustard. Give tannic acid or strong tea freely. Give demulcents. Keep head low; use stimulants as indicated, artificial heat, and artificial respiration.

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Digitalis. Recumbent position. Stomach pump or emetic (zinc sulphate, mustard, ipecac, or apomorphine). Give tannic acid (30 grains) or strong tea freely while emesis is going on. Purge with Epsom salt or Rochelle salt. Fluid extract of soap bark or fluid extract of senega are physiologically antagonistic. Give in 10-drop doses in tablespoonful of water. Aconite and tincture of opium may also be used. Stimulate with brandy or ammonia, and employ artificial respiration.

Elaterium. Treat same as for Bryonia, which see.

Ergot. Recumbent position; stomach pump or emetic. Plenty of strong tea or coffee, or solution of tannic or gallic acid. Purge with castor oil, Epsom salt, or 1 drop of croton oil; stimulate with nitro-glycerin, brandy, whisky, strychnine, or atropine. Employ friction and artificial heat.

Fowler's Solution of Arsenic. Give freely of freshly prepared hydrated sesquioxide of iron, or use the official antidote (ferri oxidum hydratum cum magnesia), both in tablespoonful doses every few minutes. Use stomach pump or emetics repeatedly. Follow with opiates to relieve pain, and use stimulants to sustain circulation and respiration.

Gelsemium. Siphon out the stomach, preferably, or give emetic of zinc sulphate, or mustard, or ipecac, or apomorphine. Give repeatedly liberal quantities of strong tea or tannic acid (30 grains) in plenty of water. Purge with castor oil. Stimulate with belladonna or atropine, or whisky, strong coffee, aromatic spirit of ammonia, strychnine sulphate (1-60 to 1-20 grain every 2 hours), or digitalis. Morphine ($\frac{1}{4}$ grain every 2 hours, or as required) is considered the most perfect antagonist. It should be used with care. Resort to artificial heat and forced respiration if needed.

Helleborus Niger. Same as for Veratrum, which see.

Horse Chestnut. Same as for *Æsculus*, which see.

Hyoscyamus. Same as for Belladonna, which see.

Ignatia. Same as for Strychnine, which see.

Ipecac. Wash out the stomach freely, give vegetable acids, as vinegar, lemon or orange juice, citric acid or tartaric acid, juice of currents, in plenty of water. Stimulate heart, if necessary, with brandy, atropine, ammonia, or digitalis.

Jaborandi (*Pilocarpus* and *Pilocarpine*). Evacuate stomach by siphon or emetic. Give strong tea or tannic acid freely. Atropine sulphate is antagonistic, or belladonna may be used. Stimu-

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late freely, give strong coffee; and morphine may be required to check nausea and vomiting.

Lobelia. Keep patient in recumbent position, and for some time after acute symptoms subside. If stomach is not well emptied, use stomach tube or emetic, preferably zinc sulphate or mustard. Give freely of tannic or gallic acid, or strong tea and coffee. Purge with castor oil, and stimulate freely with whisky, ammonia, and heart stimulants, as strychnine, atropine, or digitalis. Use artificial heat, and morphine or opium may be required to relieve nervousness and pain.

Mercury Compounds. Plenty of egg albumen whipped up in water. Evacuate the stomach rapidly by emesis or stomach tube. Employ stimulants and artificial heat to maintain circulation, and opiates for pain.

Morphine. Same as for Opium, which see.

Nitro-glycerin. Apply ice, or cloths wrung out of ice water, to head. Relieve headache with belladonna or ergot. Stimulate with whisky or strychnine, if heart flags.

Nux Vomica. Same as for Strychnine, which see.

Enanthe. Same as for Belladonna, which see.

Opium (laudanum, paregoric, morphine, heroin, codeine, syrup of poppy, soothing syrups, black drop, Godfrey's cordial, Jackson's cough syrup, etc.). Keep patient moving by means of flagellation, shouting, slapping with wet towel, alternate dashing of cold and hot water, pinching, spinal cold douche, etc.; resort to artificial respiration, and stimulate as quickly as possible. Evacuate stomach by means of tube or emetic, apomorphine being especially valuable. Give early 10 grains of potassium permanganate in pint of water. Remove this solution as quickly as possible, and repeat if necessary. If latter is not at hand, use tannic acid, strong tea, or animal charcoal freely. Cautiously administer small doses of atropine or belladonna, and copious quantities of hot, strong coffee. Give sweet spirits of nitre to keep up elimination, and catheterize. Diffusible and heart stimulants should be given, and rectal injections of tincture of capsicum may quickly arouse from stupor. Apply artificial heat, and resort to forced respiration. Do not walk the victim to exhaustion.

Phosphorus. Do not give oils or fats, except old, thick (oxidized) oil of turpentine. Use stomach pump or emetic of sulphate of copper or mustard. Give freely of Epsom salts in solution. Opiates to relieve pain.

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Physostigma. Empty stomach with tube or emetic. Give strong tea or tannic acid, or potassium permanganate (10 grains in 1 pint of warm water). Atropine (1-120 to 1-60 grain) is physiologic antagonist; chloral (10 grains every $\frac{1}{2}$ to 1 hour) next. Stimulate and support heart with strychnine or nux vomica. Resort to artificial respiration.

Phytolacca. Siphon or emetic, with large quantities of water. Stimulate with brandy, ammonia, and relieve irritation and pain with bismuth and opiates.

Rhus. (Internally.) Treat as for Sanguinaria, which see. Purge with magnesium sulphate.

Sanguinaria. Wash out the stomach, or use emetic of zinc sulphate; give strong tea or tannic acid, stimulate freely, and administer opiates, bismuth, or demulcents to allay gastro-intestinal irritation and pain.

Santonin. Siphon out stomach or use emetics. Stimulate the heart with aromatic spirits of ammonia and strychnine, and give freely of strong coffee. Control convulsions with ether or chloroform.

Silver Salts. Give freely of solution of common salt. Administer albumen or milk as demulcents, evacuate the stomach, stimulate if necessary, and relieve pain with opiates.

Staphisagria. Same as for Bryonia, which see.

Stramonium. Same as for Belladonna, which see.

Strophanthus. Treat practically the same as for Strychnine, which see. Give also purge of Epsom salts, and employ artificial respiration. Emetics to be used are zinc sulphate or mustard.

Strychnine. Empty stomach *quickly* by means of stomach pump or emetic; next to useless after tetanic symptoms have set in. Keep patient absolutely quiet, in recumbent position, in dark room. Allow no draughts of air to blow upon patient. Give freely of animal charcoal or tannic acid in water. Control spasms by inhalations of chloroform or chloral hydrate (by mouth, 30 grains or by rectum, 60 grains). Potassium permanganate and iodine are said to be chemical antidotes. They must be given well diluted and promptly removed from the stomach.

Sulphonal. If in the stomach but a short time, siphon or give an emetic (zinc sulphate or mustard, or apomorphine, with plenty of water). Administer Epsom salt ($\frac{1}{2}$ ounce) and sodium bicarbonate (1 drachm) in plenty of water. Give 2 teaspoonfuls

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sweet spirit of nitre every 1 or 2 hours. Support the heart and lungs with diffusible stimulants and strychnine hypodermically.

Trional. Same as Sulphonal, which see.

Veratrum. Recumbent position, with plenty of fresh air. If free vomiting has not already occurred, evacuate the stomach with the stomach tube; or, if not at hand, use emetic of zinc sulphate or mustard. Give freely of tannic acid in solution, or of strong tea or coffee. Stimulate freely, employ artificial heat and forced respiration. Give opium or morphine to quiet pain and restrain action of the bowels. Hot tea assists in rapidly eliminating the poison by way of the kidneys. Catheterize.

Zinc Salts. Tannic acid and albumen freely. Evacuate the stomach. Give lime water, soap suds, mucilages, and milk. Apply heat to abdomen and give opiates to relieve pain.

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LIST OF DRUG TREATISES.

sweet spirit of nitre every 1 or 2 hours. Support the heart and lungs with diffusible stimulants and strychnine hypodermically.

Trional. Same as Sulphonal, which see.

Veratrum. Recumbent position, with plenty of fresh air. If free vomiting has not already occurred, evacuate the stomach with the stomach tube; or, if not at hand, use emetic of zinc sulphate or mustard. Give freely of tannic acid in solution, or of strong tea or coffee. Stimulate freely, employ artificial heat and forced respiration. Give opium or morphine to quiet pain and restrain action of the bowels. Hot tea assists in rapidly eliminating the poison by way of the kidneys. Catheterize.

Zinc Salts. Tannic acid and albumen freely. Evacuate the stomach. Give lime water, soap suds, mucilages, and milk. Apply heat to abdomen and give opiates to relieve pain.

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A TREATISE
ON
Mangifera Indica
AND
**The National Pure
Food and Drug Act.**

The Therapeutic Uses of *Mangifera* are by JOHN FEARN, M. D., Oakland, Cal.

The Reproductions are by M. F. LINQUIST, M. D., A. J. HOWE, M. D., and I. J. M. GOSS, M. D.

The Illustrations are from *Histoire Naturelle Botanique*, Lamarck. Vol. IV. Paris, 1782.

The Description, History and Pharmaceutical Record are by JOHN URI LLOYD, Phar. M.

The Treatise on the National Pure Food and Drug Act is from the *Eclectic Medical Gleaner*, May, 1907, by JOHN URI LLOYD.

Treatise No. I embraces *Thuja Occidentalis*.

Treatise No. II embraces *Cactus Grandiflorus*.

Treatise No. III embraces *Pilocarpus* (*Jaborandi*.)

Treatise No. IV embraces *Veratrum Viride*.

Treatise No. V embraces *Chionanthus Virginica*.

Treatise No. VI embraces Asepsin and Asepsin Soap.

Treatise No. VII embraces *Collinsonia Canadensis*.

Treatise No. VIII embraces *Nux Vomica*.

Treatise No. IX embraces *Gelsemium*.

Treatise No. X embraces *Belladonna*.

**Treatise No. XI embraces *Oenanthe Crocata*, Vegetable
Caustic and *Crataegus*.**

Treatise No. XII embraces *Ergot*.

Treatise No. XIII embraces *Macrotys*.

Treatise No. XIV embraces *Dioscorea*.

**Treatise No. XV embraces Development of the Pharma-
ceutical Still.**

Treatise No. XVI embraces *Scutellaria* [in press].

**Treatise No. XVII embraces *Mangifera Indica* and The
National Pure Food and Drug Act.**

Treatise No. XVIII will embrace *Libradol*.

Drug Treatise, Number XVII.

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Mangifera.

[MANGO.]

Part Used.—The inner bark of the root of *Mangifera indica*, Linné.

Botanical Source.—A tall tree, native of the East Indies, but cultivated in most parts of the tropics for its highly valued, edible fruit. The tree, of which there are numberless varieties, grows to great size, old trees being fully sixteen feet in circumference. It has "become thoroughly naturalized in the West Indies, and is forming large groves in waste places in Jamaica, where negroes, horses, pigs, and fowls feed upon the fruit for nearly four months of the year." C. D. Morris, *Amer. Jour. Pharm.*, 1886, p. 344, from *Gard. Chronicle*.) The leaves are alternate, lanceolate, entire, from 6 to 8 inches long, and one-quarter as wide. They are petioled, and borne in clusters near the end of the branches. The flowers are small, yellowish, and disposed in large, loose, terminal panicles. The calyx-lobes and petals are five. The stamens are five, alternate with the petals, and all but one abortive. The fruit is a reddish-yellow drupe, about the size of a quince, and kidney-shaped; it consists of a hard, fibrous nut, which is surrounded by edible flesh in a manner like a peach, and is known as "mango fruit." It is largely consumed in tropical countries, and forms one of the most highly esteemed fruits, being both eaten raw and made into tarts, jellies, etc. The Turkoman poet, Smir Khusru, wrote, "The mango is the pride of the garden, the choicest fruit of Hindustan; other fruits we are content to eat when ripe, but the mango is good in all stages of its growth." The natives of India use the leaves and leaf-stalks to harden the gums; the wood, together with sandal-wood, is used by the Hindus for burning their dead, and an infusion of the bark is employed for various skin diseases. When incisions are made into the bark of the tree, a soft, reddish-brown gum-resin exudes, which hardens by age, and resembles bdellium; this dissolves in spirits and partly in water, forming milky solutions; when chewed, it softens, adhering to the teeth, and gives a pungent and slightly bitter taste (Roxburgh).

Sir J. D. Hooker reports (*Pharm. Jour. Trans.*, 1883, Vol. XIV, p. 501), that the yellow pigment, known as *piuri*, or *Indian yellow* (compare *purree*), is produced in India by evaporating the urine of cows, which are fed exclusively on mango leaves.

According to Dragendorff (*Heilpflanzen d. versch. Volker u. Zeiten*, 1898), the bark contains 16.7 per cent of tannic acid and an acrid oil: the fruit contains much sugar, citric acid, mucilage, and yellow coloring matter.—*American Dispensatory*.

MANGIFERA.

Oriental History.—In Oriental mythology, the mango has a conspicuous place, being supposed to be a transformation of Prajapati, the "Lord of Creatures." Its interesting legends may be briefly given as follows:

"The tree provides one of the *pancha-pallava* or aggregate five sprigs used in Hindu ceremonial, and its flowers are used in Shiva worship on the Shivaratri. It is also a favorite of the Indian poets. The flower is invoked in the sixth act of Sakuntala, as one of the five arrows of Kámadeva. In the travels of the Buddhist pilgrims, Fah-hian and Sung-yun (translated by Beal), a mango grove (Amravana) is mentioned, which was presented by Amradarika to Buddha, in



MANGIFERA INDICA, leaf, flower and fruit.

From Histoire Naturelle, Botanique, Vol. IV, Lamarck. Paris, 1782.

order that he might use it as a place of repose. This Amradarika, a kind of Buddhist Magdalen, was the daughter of the mango tree. In the Indian story of Surya Bai (see Cox, *Myth. of the Arian Nations*), the daughter of the sun is represented as persecuted by a sorceress, to escape from whom she became a golden lotus. The king fell in love with the flower, which was then burned by the sorceress. From its ashes grew a mango tree, and the king fell in love, first, with its flower, and then with its fruit: when ripe, the fruit fell to the ground, and from it emerged the daughter of the sun (Surya Bai), and was recognized by the prince as his lost wife. Long articles upon the virtues of the mango, in its ripe and unripe state (keri), may be found in Hindu and Mahometan works on *Materia Medica*.—Dymock, *Pharmacographia Indica*.

In Oriental Medicine, all parts of the mango have more or less importance, as may be seen from the following, condensed from Dymock's *Pharmacographia Indica*:

"Unripe mangos, peeled and cut from the stone and dried in the sun, form the well-known Amchur, or Ambosi (Amrapesi, Sans.), so largely used in India, as an article of diet. As its acidity is chiefly due to the presence of citric acid, it is a valuable antiscorbutic. It is also called Am-ki-chhitta and Am-khushk.

MANGIFERA.

The blossom, kernel, and bark are considered to be cold, dry, and astringent, and are used in diarrhea, etc. The smoke of the burning leaves is supposed to have a curative effect in some affections of the throat. According to the author of the *Makhzan*, the Hindus make a confection of the baked pulp of the unripe fruit, mixed with sugar, which, in time of plague or cholera, they take internally and rub all over the body. It is also stated, in the same work, that the mid-ribs of the leaves, calcined, are used to remove warts on the eyelids. Mangos appear to have been known to the Arabs, from an early date, as a pickle; they were, doubtless, carried to Arabian ports by Indian mariners. Ibn Batuta, who visited India, A. D. 1332, notices their use for this purpose. The powdered seed has been recommended by Dr. Kirkpatrick as an anthelmintic (for lumbrici), in doses of 20 to 30 grains, and also as an astringent in bleeding piles and menorrhagia. (*Phar. of India*, p. 59.) From the fruit, just before ripening, a gummy and resinous substance exudes, which has the odor and consistence of turpentine, and from the bark a gum is obtained, which is partly soluble in cold water. Ainslie says that the gum-resin, mixed with lime juice or oil, is used in scabies and cutaneous affections."

But it was reserved for the Eclectic medical profession in America, through Dr. M. F. Linquist, to establish the value of the bark of the root, as it is now employed, in which direction the drug, on Dr. Linquist's authority, is now recognized in the *Pharmacographia of India*, page 384.

American History.—In 1877, Dr. M. F. Linquist, of New Haven, Conn., was impressed by the sensible qualities of a bark imported to that city, under the name mango, for the purpose of removing incrustations from steam boilers, it having been stated that when a small amount of a strong solution of the bark was added to the water within the boiler the saline deposit would quickly separate. The peculiarly astringent property of the bark suggested to Dr. Linquist its possible application and value in a therapeutical sense, and the experiments he made in this direction were so satisfactory in their result as to lead him to a more extended study of the properties of the drug. The bark as obtained by Dr. Linquist was in the form of a coarse powder, none of the fragments being entire. It had a deep, brownish-red color, and a peculiar odor, being in a slight degree terebintheous. In this same year (1877) Dr. Linquist corresponded with John Uri Lloyd, who made the experimental preparations for clinical investigation. Specimens of the drug being submitted to Professor John M. Maisch, it was referred to *Mangifera indica*, and as such was classified.

Medical Properties and Uses.—*Mangifera* bark has been recommended in the treatment of nasal catarrh, diarrhea, dysentery, vaginitis, metritis, diphtheria, hemorrhages, etc. Dr. Linquist, in his original statement concerning its use, says: "I have used it upward of eight years, and have experimented largely with it. It is an astringent of peculiar power upon the mucous membrane. I first employed it in certain uterine diseases with marked benefit. In catarrh, with the spray atomizer, I have used it with better success than any other agent. In diphtheria and other malignant diseases of the throat its effect has been truly marvelous. During the last year I have had several cases of diphtheria that I have treated with *Mangifera*, penciling the fauces with it, of full strength, and also using it as a gargle in the proportion of two fluid drachms to four fluid ounces of water. As an internal remedy in hemorrhages from the uterus, bowels, or lungs, or in muco-purulent discharges from either the bowels or uterus, I know of no agent equal to it. It appears to have the fol-

MANGIFERA.

lowing advantages: The dose is small, the remedy is easily taken, it has no disagreeable taste, does not derange the stomach, is rapid in its action and more certain in its effects than other medicines."

In 1882, Dr. Linnquist again contributed as follows to the *Eclectic Medical Journal* concerning the therapy of *Mangifera*:

"The value of *Mangifera* as a therapeutic agent has in my hands proved of so great efficiency that I look upon it as a duty to make known its usefulness to the medical profession. So many new remedies have been introduced within a few years, and so many virtues ascribed to them, that it becomes a delicate subject for a physician to laud a new remedy for fear that he may be classed as an empiricist. However, I take a certain amount of credit to myself for being the first to introduce *Mangifera* to the medical profession.

"I have used *Mangifera* for upwards of ten years, and it has never disappointed me in its action. I have experimented with it largely, and have found it an astringent of peculiar power. This bark contains tannin, but it differs from tannic acid in that it will not cause constipation of the bowels. It can be given during active inflammation without the slightest danger. It can be used with great advantage in cholera, typhoid fever, cholera infantum, diarrhea, and all diseases with liquid discharges from the bowels. My first experiment was in uterine inflammation and in ulceration of the cervix by painting the ulcerated surface with the fluid extract (full strength), and using a weak solution as an injection. I have thus been enabled to overcome the most obstinate diseases of this nature. In gynecological therapeutics *Mangifera* is a most valuable agent. It lessens catamenial pain, cures leucorrheal discharge, diminishes profuse menstrual evacuation, and corrects menstrual disorders in general. In nasal catarrh a weak solution used with the spray atomizer is by far the best agent I have ever used. As an internal remedy for hemorrhage of the uterus, bowels, or lungs, and also in muco-purulent discharges from either, I know of no agent equal to it.

"In diphtheria this remedy has perhaps its largest therapeutic value. I apply it (full strength) to the fauces with a camel's hair brush, and also use a weak solution of it as a gargle. I can honestly assure the medical profession that it has never disappointed me. I do not wish it to be understood that this agent alone will cure malignant cases of diphtheria, but I do assert that I know of no remedial agent in the whole materia medica that meets the requirements as well as *Mangifera indica*.

"As an antiseptic agent, internally or externally employed, *Mangifera* will prove of great value, as it is decidedly opposed to decomposition. Possibly this is in consequence of its terebinthene-like aromatic constituent rather than its astringent qualities."

Professor Howe says:

"I have found *Mangifera* of marked service in the treatment of profuse and exhaustive menstrual fluxes. In uterine hemorrhage following miscarriage, the agent exerts a powerfully restraining influence upon the hemorrhagic waste. In the sanguineous losses, which often occur about the change of life, and when uterine tumors are developing, the *Mangifera* is the most potent and reliable medicine ever introduced to the notice of the medical profession. I prescribe the fluid extract, in five-drop doses, every three or four hours. In a short time, the influence of the medicine is observed, and in a few days the desired effect is realized. No remedial agent of so great value, for the purpose named, has been introduced to the profession; it is as near a specific for profuse menstruation and uterine hemorrhage as may be desired. I might report ten or twelve cases in which the medicine exerted just such an action as was wished."

Professor Goss says of it:

"I have tried *Mangifera indica*, and find it to be an astringent of superior power. There is a property in it not found in ordinary astringents. I had a case of chronic diarrhea, of long standing, attended with indigestion, debility, and much pain in the umbilicus. I suspected ulceration, and gave the patient hydrastis and bismuth, but with only partial relief. About this time, I secured the *Mangifera indica*, put the patient upon it, and cured the diarrhea. I have waited for several weeks, and find the effect so far permanent. I am much

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pleased with it, and predict that it will prove a valuable acquisition to our list of astringents. It has the following advantages over other astringents: The dose is small, easily taken, has no disagreeable taste, and does not disarrange the stomach; hence it is well adapted to infants and persons with fastidious stomachs. It is rapid in its action, and more certain in its effects, than most other remedies."—*Eclectic Medical Journal*, September, 1882.

Professor A. J. Howe, M. D., continued the use of this remedy, and again wrote, as follows:

"During the past year I have prescribed a tincture of *Mangifera indica* on many occasions, and find it most useful in lessening leucorrhœal discharges and in diminishing too profuse menstrual evacuations. The agent exerts an astringent action, but not to the extent of constipating the bowels. It assuages catamenial pains to an appreciable degree, and corrects menstrual disorders in general. I consider the medicine a valuable adjuvant to gynecological therapeutics. I have also prescribed it in the treatment of chronic diarrhea and in obstinate gleet, and have obtained quite satisfactory results, though not better than from the use of the extract of logwood, or *Pinus canadensis*. In a case of albuminaria, the remedy, for a week or two, greatly lessened the amount of albumin discharged, yet it made no decided change for the better."

Let us now, after *Mangifera* has been introduced thirty years and thoroughly established in the practice of thousands of American physicians, give its therapeutic position and field, in the words of Professor John Fearn, M. D., Oakland, Cal.:

THE THERAPEUTICS OF MANGIFERA INDICA.

BY DR. JOHN FEARN, OAKLAND, CALIFORNIA.

About 1872, Dr. M. F. Linquist, of New Haven, Connecticut, first saw the bark of this tree in commerce, and being struck with its appearance and taste, he sent a package of it to John Uri Lloyd, who made of it a Fluid Extract for experimental use. In this Dr. Linquist soon found he had a grand therapeutic agent. It was next introduced to Professor Howe, who decided that Dr. Linquist had added to the physicians' armamentarium, a most useful weapon. Soon after this, Professor Howe published an article on this drug in the *Eclectic Medical Journal*. It was in the year 1877 that I learned of the medical properties of *Mangifera* from Professor Howe's lips. At that time, many thought that Howe was an entire skeptic as to the medicinal and therapeutic effect of drugs. But I was a close student of Howe, and soon discovered that though he did not believe everything that was said about organic medicines, yet he had a list of drugs that he knew well, and he knew where and how to use them. From that time I began the systematic study of *Mangifera Indica*, and can truly say that in its own field, there is no drug in which I have more confidence.

Properties of *Mangifera*.—Its first and chief property is that of an astringent, but its astringency is of a peculiar kind. Like some other members of this class of remedies, it contains a form of

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tannic acid, but not an aggressive form, for it does not, like so many of the tannates, lead to constipation. *Mangifera* seems to combine with its astringent properties the action of a *sedative to mucous surfaces*, both soothing and astringent, but at the same time it is distinctly *tonic*, increasing vascular tonicity, aiding the appetite, and checking discharges, whether of mucus or blood, and particularly, never disturbing the stomach.

Mangifera is also antiseptic, as proved by Dr. Linquist's great success with it as a local application in diphtheria, and as any physician may prove by observing its effect on the excretions.

These properties, then, are the key to the action of *Mangifera Indica*, making it one of the very best remedies for the relief of catarrh of the head, throat, stomach and bowels, for cholera infantum, dysentery, diarrhea, leucorrhea and for checking hemorrhages. The specific indications calling for the use of this remedy may be stated as follows:

Specific Indications.—The patient is in an atonic condition, muscular system relaxed, circulation poor, appetite poor, often anemic, much depressed; the hemorrhage is passive. Following this line of indications, *Mangifera* may be given internally, with almost certainty of relief. Let me illustrate.

My first serious test of *Mangifera* was in a severe case of hemorrhage following abortion. There was no gushing of blood, but a steady and continual drain, so that it was becoming serious. Ten drops of Specific Medicine *Mangifera* were given in water every two hours. The effect was remarkable, the hemorrhage was stopped, and the patient made a good recovery. The remedy might have been given more frequently, had not its effect been shown at once, as in emergency cases, the dose may be repeated every fifteen minutes.

In hemorrhage of the lungs, I have given *Mangifera* so often that I have learned to rely upon it in passive cases, and it has done more for me than any other remedy. Take one case, a young man suffering from pulmonary tuberculosis aggravated by the drink habit, with hemorrhages not heavy but continuous. I had helped him many times. One night when I was away from home, a neighboring physician was called, a man of more than ordinary resourcefulness. He had no success. The next morning I was called, and at once administered *Mangifera*, which checked the hemorrhage as it had done before in his case, and as it has done in case after case of hemoptysis. I have also had good results in hemorrhage of the bowels, where it not only checks the bleeding, but improves the general condition. In epistaxis it is a very good remedy, though sometimes we may have to resort to plugging.

In gynecological therapeutics *Mangifera* is a most valuable remedy. Howe and Linquist both tell us that it lessens catamenial

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pain, cures leucorrheal discharges, diminishes profuse menstrual evacuation, and corrects menstrual disorders in general.

In 1882 Dr. Linqvist said in the *E. M. Journal*, "As an internal remedy for hemorrhage of the uterus, bowels or lungs, I know of no agent equal to it." My experience agrees with that of Dr. Linqvist, other than that the hemorrhages in my cases have been *passive*.

Not long since, a man called upon me complaining of pain in his back. His general health was below par. On examination of the urine which was very dark, and taking into consideration all the symptoms, it seemed clear that blood was coming from the kidneys. The bowels were first well flushed, and then he was given six drop doses of Specific Medicine Mangifera every two or three hours. The effect was speedily apparent, the hemorrhage being checked and the general condition much improved.

In two cases of dysentery, Mangifera was used with marked success. In one, the man had long lived in Central America, the other was the case of a soldier invalided from the Philippines. These were both bad cases, both very much emaciated. The soldier was in a terrible condition, the bowels moving frequently, night and day, destroying his rest, and the man was wasted almost to a skeleton. The discharges were principally pus and blood. The affection had resisted all the remedies in the military hospital, and the patient was sent home, apparently in a hopeless state. In both these cases Mangifera proved to be a grand remedy, leaving little to be desired, so far as its action upon the bowels was concerned, checking the frequent discharges and healing the bowels, so that the pus soon disappeared from the discharges and the stools became normal.

In diphtheria, where Dr. Linqvist found Mangifera so useful, I have not as yet used it locally or otherwise, but from an experience I had about three weeks ago, I shall certainly use it in my next case. I was treating a lady for an inflamed and very painful throat, the soft palate, the fauces and the whole surface of the pharynx being involved and very red. The follicles being very much enlarged, swallowing was difficult and painful, the throat becoming dry at night in spite of packs, so that sleep was almost impossible. Adding three drachms of Specific Medicine Mangifera to four ounces of water, I directed her to use a teaspoonful of the mixture as a gargle, every hour, then less frequently as relief came. Improvement followed immediately, and she was soon out. Next she took cold and the trouble returned with great severity, but the same remedy soon restored her.

In cases of catarrh of the head, especially where there is a heavy discharge and atonic conditions. Mangifera may be used as follows:

Dose:—℞ Specific Medicine Mangifera Indica, ... 3 i to 3 iiii.
Aqua, ... 3 iv.

Misce.

Sig.—Use as spray, or by snuffing up the nose, or by the use of the nasal douche.

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In such cases, if the specific conditions are pronounced, *Mangifera* leaves little to be desired. It improves the condition of the mucous membrane, and thus acts, not by drying up the secretions, but by correcting the abnormal conditions of the parts.

In hemorrhage, if passive, *Mangifera* increases vascular tonicity, and thus prevents seepage and passive hemorrhage. In stomach and bowel troubles, in catarrh of the head and throat, the conditions are atonic, at least this is my experience, yet, although the tonic properties of the drug point to it as being a remedy pre-eminent in atonic conditions, it is not interdicted in inflammations, for Dr. Linquist has used it successfully in ulceration of the os uteri, as well as in diphtheria. In my case of inflammation involving the throat, there was a high grade of inflammation, and yet the remedy acted quickly and pleasantly.

In conclusion, let me say that the medical profession and the public at large are under lasting obligations to Dr. Linquist who first observed and experimented with the bark, *Mangifera*; to John Uri Lloyd, who had it botanically located by Professor Maisch, and made experimental preparations of the drug for Dr. Linquist's use and afterward perfected the Specific Medicine, *Mangifera*.—*Chicago Medical Times*, June, 1904.

SPECIFIC INDICATIONS AND USES.

Specific *Mangifera* is a stimulating tonic and astringent, possessing antiseptic qualities. It is indicated in feeble, relaxed tissues; mucous profluvia and chronic diarrhea and dysentery with muco-purulent conditions; muco-purulent discharges from the bowels. It is to be used both internally and locally. Ulcerations of the mouth and other membranes, nasal catarrh, bronchial catarrh, vaginal leucorrhea, menorrhagia, malignant throat diseases, albuminuria, vaginitis, diphtheria, diarrhea and hemorrhages are conditions in which it has served a good purpose.

Specific Use.—Tonic-astringent to enfeebled mucous tissues with profuse discharges. In catarrh, leucorrhea, gleet, diarrhea, dysentery and all passive hemorrhages.

Dose.—℞ Sp. Med. *Mangifera*, 3 j to 3 jii.
Aqua, ℥ iv.

Misce.

Sig.—A teaspoonful every one or two hours.

PRICE OF SPECIFIC MEDICINE MANGIFERA.

¼-lb. Packages, ...	75c. each.	By mail, 97c.
½-lb. "	\$1.40 "	Not mailable.
1-lb. "	2.75 "	Not mailable.

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PUBLISHERS' DEPARTMENT.

JOHN URI LLOYD, PHAR. M., EDITOR.

PHYSICIANS AND THE NATIONAL FOOD AND DRUGS ACT.

Effective January 1, 1907.

BY THE DEPARTMENT EDITOR.

"Be sure you are right, and then go ahead."

Retrospective.—The early days of American medicine were dominated by the cry for "*liberty*." At that date the word "*liberty*" meant, in medicine as in politics, patriotism, fairness from man to man, justice to mankind. A sparsely settled country, having few physicians, necessitated self-educated physicians, the introduction of family medicines and home medication. Not less earnest and honest were the makers and devisers of these home cures, nor less studious the home-bred physician, than were others engaged in the people's welfare. The minister and the physician were often one, and thus became the teachers of the methods of home-medication. "Domestic Medicine" was a necessity in those widely separated households, and such men as Peter Smith were typical of lives sacrificed in its behalf. Some of the most conspicuous physicians of those times wrote domestic works for the people, and taught them the rudiments of home-medication. Their primitive compounds and derivatives thereof, under scientific names, are to-day given places in our Pharmacopœias. These home-remedies were usually simples, such as salves, cough syrups, tonics, febrifuges, etc., made of plants and plant products. They were crude and often violent, but as a rule not harmful, as concerns narcotics and anodynes.¹ In these times and under these influences and conditions was born the American, or Eclectic School in Medicine.

¹ I am speaking of American medication. I fully comprehend such substances as Godfrey's Cordial and Bateman's Drops, of European introduction. I am also aware that the barbarous methods of regular medication inherited from Europe were too often paralleled in America by educated physicians, and that often the "heroic" idea prevailed in domestic medication.

But as time passed, the making of primitive home-medicines flowed into other channels. Imposters appeared who acted upon the principle that the "people's rights" demanded that all forms of selfishness that could be practiced were allowable in this "Land of Liberty." The old-style family medicine business was insidiously usurped by the man who claimed the right to dose his fellow-men with harmful drugs, with slave-breeding narcotics, with demoralizing stimulants, without let or hindrance, by reason of the American idea that restriction, even in this direction, meant loss of liberty to an individual, who was a part of the people. Liberty to do right was thus perverted into license to do wrong. America became a land of medical self-dosing freedom, to whosoever cared to mislead, to abuse, to mistreat her citizens under any guise whatever, that related to either harmful or worthless medication. This condition of affairs increased, insidiously, until at last even the popular cry of "Liberty" in a country of licensed liberty, could not stem the torrent of protest of an incensed and indignant community who found the sacredness of home and of family invaded by the grossest kind of medical impositions in which company the good was not to be distinguished from the bad. The evil culminated when in the closing years of the last century, the German synthetics, the heart-depressants, the coal-tar energetics, fostered under the care of the Regular medical profession, were made into tablets, pills and powders by charlatans, politicians, and such, and were sold by whosoever cared to do so, in death-dealing quantities, as headache cures, etc., to whoever would innocently take them. Then arose an army of Americans demanding that in these directions the term *Liberty* be restricted.

Medicines, Drinks, and Foods.—The eyes of most of the crusaders were, however, fixed primarily upon wrongs committed by the mighty aggregations of capital that control American food-stuffs. The people of former days had been served with home-cured or fresh meats by local butchers, and other forms of food-products that had been prepared directly under the eye of the consumer. The mighty monopolistic establishments that now appeared in the field, *food factories*, shipping as they did their products to all parts of America, and even to the world at large, found it desirable to utilize the art of the chemist and the maker of medicines, in the line of food preservatives. His elbows touched those of the maker of heart paralyzers. The chemist's art became

also a necessity with the concoctors of the insidious artificial drinks and narco-alcoholics that, in enormous quantity, were thrown into the American market. Included among these were liquids advertised to the people as medicines, but used by the people, knowingly or innocently, as alcoholic stimulants or as narcotics. The reputation of the old-time, serviceable home-remedy, in its simple helpfulness, (often heroic, but less vicious than much of the "Regular" medication), had been taken advantage of by the makers of deceptive narcotic and stimulating mixtures, that debased and enslaved the people. The stigma rested, too, upon the makers of old-time home-remedies, who through many years had established excellent reputations, and whose preparations carried no harmful drugs or stimulants.

The Awakening.—But at last the cry of "liberty" to do as one chose, could no longer, as has been said, be construed as a license to cover the crimes that were committed, the wrongs that were done, and the injuries that were accomplished under that seductive but much abused name. Some of the powerful American magazines, as well as many of the more creditable newspapers, united with temperance people, physicians, and other philanthropists, to throw themselves into a crusade designed to better conditions, and in this cause the Agricultural Department at Washington, and the Internal Revenue Department became integral parties. That the innocent were often misjudged, and the guilty neglected, in this crusade, is evident to whoever views the subject impartially. Be this as it may, the maker of National laws, Congress, which should always be the servant of the people, but which, unfortunately, does not always look to the best interests of the people, could no longer resist the demands of the people. Consequently, June 30th, 1906, the bill known as "The National Pure Food and Drugs Act," became a law of the United States.

Scope of the Bill.—Aiming as it did at the indicated phases of corruption, this law struck all the makers and users of medicines, foods, and drinks. Such were its outreaches, that its authors scarcely realized the extent of its ramifications. Industries long established and seemingly unconcerned, were destined to be revolutionized. Every article of food designed for inter-State commerce or sale in a Territory, all remedial agents, crude drugs, flavoring extracts, alcoholic liquors, the concoctions sold as stimulating cordials and drinks, and the popular medicinal stimulants, legitimate

and illegitimate, were included in its scope. A great blanket, this bill knew no difference between men, so far as surveillance and inspection of products were concerned. The *people* were to be cared for, the individual's *stomach* became at last a ward of the Nation.

The man who put salicylic acid into oysters, benzoate of sodium into catsup, or borax into beef, as well as the man who supplied food-products without such substances, were alike to be watched.

The makers of so-called "medicines" used as stimulants, in wine-glass doses because of the alcohol in them, and the makers of legitimate medicines necessarily containing alcohol as a solvent, but in which the alcohol is inappreciable as a stimulant by reason of its minute dose, are classed together. Alcohol is alcohol, in the eyes of the law. Whether prescribed in the fraction of a drop by the trained physician, or taken by the glassful under the name of an artfully advertised home-remedy, its amount must now be given on the label.

Harmful secret mixtures containing alkaloids, such as cocaine and morphine, sold the people, are included with the same substances legitimately prescribed by physicians as tablets, pills, prescriptions or powders.* Narcotic alkaloids, if abused, are perhaps used to greater harm than any other form of medicine, and physicians prescribing them legitimately must obey the law's exactions concerning their use, and observe the law's restrictions concerning their distribution, as strictly as must persons who heartlessly craze their victims by cocaine, or lead them into slavery by morphine.

Long-established family remedies, harmless, perhaps, as concerns their effects in home self-treatment, useful to the users of simples, meet the same law their disreputable companions must face.

Briefly, the National Law, effective January 1st, 1907, embraces about everything that can be corrupted or misbranded, from maple syrup mixed with glucose, to assafetida mixed with sand. It demands that the substances designated in its details under the rulings of the Committee (Article 28, pages 7-8) must be published on every label when sold as drugs. No distinction is made between charlatan, physician, dispensing pharmacist or manufac-

* Where reference is made in this paper to *alkaloids* and *narcotics* those mentioned by the Regulations are understood. But as the Committee reserves to itself the privilege of extending the list to other substances of similar nature, it is likely that such substances as *hyoscyamus*, *stramonium*, *belladonna*, etc., must not be neglected.

turer. The awakened people had at last said to wrong doers, "No longer can you practice your art without a criminal prosecution by the United States Government." But since the law has no favorites, whoever breaks it, (be it by intent, ignorance or indifference), becomes a wrong-doer. And since wrong-doers do not brand themselves, the Government must find them.

The Slumberers.—The majority of the people concerned in this enactment thought only of *corrupt* wrong-doers. Few imagined that persons trying to do right had any concern in its enforcement or need be put to any trouble or expense whatever. As regards medicines, only the parties whom the magazines had so publicly attacked, and such as they, were thought of. Fair pharmacists and legitimate physicians gave the law no concern, for they did not include their products in its rulings. Thus the professions and others involved slumbered, indifferent to the fact that this law demanded, in its enforcement, that the regulations which were to control the wrong-doers, must also, in its exactions, apply to whosoever sold the same materials legitimately. Narcotic alkaloids, heart depressants, narcotic drugs, alcohol, chloroform, ether, and such are, by this law, to be exposed to view by the prescribed form of label, whenever sold in inter-State commerce by any one. Whoever sells them in any Territory, the District of Columbia, or across any State line in America, must do so under the exacting conditions imposed by the Departments of the Government whose duty it is to enforce the law.

The Second Awakening.—During the two months following the passage of the bill in July, 1906, neither pharmacist, physician, importer, nor dispenser of drugs gave the law the least concern. None seemed to appreciate the fact that January 1st, 1907, was approaching, when, under the law's exactions, they would all come under the surveillance of the Government. In September, 1906, came the awakening. The Committee appointed by the Government, Dr. H. W. Wiley, Chairman, advertised that they would meet in New York and confer publicly with interested parties. They also announced their tentative rulings, showing who and what were concerned. Like the shock of a volcanic explosion came these rulings to the abruptly awakened sleepers. Pharmacists, liquor men, importers, manufacturing druggists, proprietary medicine men, and participants in connected and yet separated interests, now perceived their dilemma. They took the first train to New York.

At the meetings of the Committee, which continued a week, it was seen that all these business interests must be revolutionized. It was also perceived that no favoritism was to be shown any one, and that the regulations this Committee would adopt would be enforced, to the minutest details, and regardlessly. Millions of dollars were involved. An untold amount of care and much expense must hereafter be constantly exercised in order to protect both manufacturers and the patrons of the many interests concerned.

Conditions Under Which the Government May Prosecute.—Remember, the Government has no power, according to this bill, (if at all), to disturb or regulate the internal affairs of any State. Consequently, this National Law does not presume to dominate business *within a State*. It does, however, regulate business within a Territory, and also within the District of Columbia, and applies to any interdicted substance whatsoever that, in an original container, in commerce, crosses a State line, whether carried by messenger, by mail, by express, or by freight. It applies alike to importers, to jobbers, dealers in crude drugs, retailers of medicines, manufacturers big or little, and to all compounders, dispensers and prescribers, if they do inter-State business. No man who sells crude drugs, or manufactured products for use in prescriptions, or in mixtures, is absolved from its regulations. Like a thunderbolt came the perception of these facts to men engaged in these various interests.

Scope of the Rulings of the Committee.—After hearing the arguments made in New York by representatives of the various interests, the National Committee took them severally under advisement, and October 20th, 1906, gave in full the text of the regulations that were to be enforced. These, *comprising forty sections*, had been adopted by the Secretaries of the Treasury, of Agriculture, and of Commerce and Labor, at Washington. The utmost details were given concerning title, form of label, type employed, position of manufacturer's name on the label, standards for drugs, poisonous or deleterious ingredients, preservatives, coloring matters, character of raw material, name and address of manufacturer, character of title, distinctive name, compounds or imitations, articles without a label, substances incompletely branded, substitution products, methods of stating quantity or proportions, statements of weight or measure, and other details of a similar nature. It was shown that the Government had made an exhaustive study of the problem, in the broadest and fairest sense.

Result.—Every person concerned in the making or using of a medicine found himself involved in many directions, aside from the materials sold. The form of the label demanded by the Committee was different from that used by any manufacturing pharmacist or maker of medicines in America. The location of the name of the manufacturer, as concerns the label's title and text, as well as the size of the type employed in printing the labels, was specified. None of these fully accorded with labels in use by any one. Pharmaceutical preparations containing the restricted alkaloids and alkaloidal compounds, synthetic heart depressants, narcotics, alcoholic menstrums, which latter include all tinctures, fluid extracts, etc., must be labeled in accord with the Government's regulations, not one old label, so far as this writer knows, being precisely legal. To at once enforce the law would have paralyzed the medical and pharmaceutical interests of America, as shown by the list of proscribed mislabeled drugs (See *Article 28*, following). But the aim is not to *persecute* any one, rather, to *help* those *aiming to do right*.

LIST OF PROSCRIBED SUBSTANCES.

REGULATION 28.—SUBSTANCES NAMED IN DRUGS OR FOODS.

(Section 8, second under "Drugs;" second under "Foods.")

(a) The term "alcohol" is defined to mean common or ethyl alcohol. No other kind of alcohol is permissible in the manufacture of drugs except as specified in the United States Pharmacopœia or National Formulary.

(b) The words alcohol, morphine, opium, etc., and the quantities and proportions thereof, shall be printed in letters corresponding in size with those prescribed in Regulation 17, paragraph (c).

(c) A drug or food product except in respect of alcohol is misbranded in case it fails to bear a statement on the label of the quantity or proportion of any alcohol, morphine, opium, heroin, cocaine, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate or acetanilide or any derivative or preparation of any such substances contained therein.

(d) A statement of the maximum quantity or proportion of any such substances present will meet the requirements, provided the maximum stated does not vary materially from the average quantity or proportion.

(e) In case the actual quantity or proportion is stated it shall be the average quantity or proportion with the variations noted in regulation 29.

(f) The following are the principal derivatives and preparations made from the articles which are required to be named upon the label:

Alcohol, Ethyl (Cologne spirit, grain alcohol, rectified spirits, spirits, and spirits of wine): Derivatives—Aldehyde, ether, ethyl acetate, ethyl nitrite and paraldehyde. Preparations containing alcohol—Bitters, brandies, cordials, elixirs, essences, fluid extracts, spirits, syrups, tinctures, tonics, whiskies and wines.

Morphine, Alkaloid: Derivatives—Apomorphine, dionine, peronine, morphine acetate, hydrochloride, sulphate and other salts of morphine. Preparations containing morphine or derivatives of morphine—Bougies, catarrh snuff, chlorodyne, compound powder of morphine, crayons, elixirs, granules, pills, solutions, syrups, suppositories, tablets, triturates and troches.

Opium, Gum: Preparations of opium—Extracts, denarcotized opium, granulated opium and powdered opium, bougies, brown mixture, carminative mixtures, crayons, Dover's powder, elixirs, liniments, ointments, paregoric, pills, plasters, syrups, suppositories, tablets, tinctures, troches, vinegars and wines. Derivatives—Codeine, alkaloid, hydrochloride, phosphate, sulphate and other salts of codeine. Preparations containing codeine or its salts—Elixirs, pills, syrups and tablets.

Cocaine, Alkaloid: Derivatives—Cocaine hydrochloride, oleate and other salts. Preparations containing cocaine or salts of cocaine—Coca leaves, catarrh powders, elixirs, extracts, infusion of coca, ointments, paste pencils, pills, solutions, syrups, tablets, tinctures, troches and wines.

Heroin: Preparations containing heroin—Syrups, elixirs, pills and tablets.

Alpha and Beta Eucaine: Preparations—Mixtures, ointments, powders and solutions.

Chloroform: Preparations containing chloroform—Chloranodyne, elixirs, emulsions, liniments, mixtures, spirits and syrups.

Cannabis Indica: Preparations of cannabis indica—Corn remedies, extracts, mixtures, pills, powders, tablets and tinctures.

Chloral Hydrate (Chloral, U. S. Pharmacopœia, 1890): Derivatives—Chloral acetophenoxim, chloral alcoholate, chloralamide, chloralimide, chloral orthoform, chloralose, dormiol, hypnal and uraline. Preparations containing chloral hydrate or its derivatives—Chloral camphorate, elixirs, liniments, mixtures, ointments, suppositories, syrups and tablets.

Acetanilide (antifebrine, phenylacetamide): Derivatives—Acetphenetidine, citrophen, diacetanilide, lactophenin, methoxy-acetanilide, methylacetanilide, para-iodoacetanilide and phenacetine. Preparations containing acetanilide or derivatives—Analgesics, antineuralgics, anti-rheumatics, cachets, capsules, cold remedies, elixirs, granular effervescent salts, headache powders, mixtures, pain remedies, pills and tablets.

Pharmacists and Physicians Alike Involved.—Immediately on the publication of this formidable list of proscribed substances, the pharmaceutical press of America became violently excited. Journal after journal reached the Lloyd Library in editorial convulsions. Staid journals suspended their study of pharmacy problems and gave their time and attention to the answering of questions promulgated by alarmed pharmacists and medicine makers, concerning the law's details. This crusade is still on, and its details can not be even briefly mentioned here. The cry for special information has, seemingly, not decreased. Briefly stated, it was shown that the defective labels on bottles in wholesale druggists' stocks were liable to lead to great trouble. Neither care nor money could correct these imperfections by January 1st, because the time to do so had nearly passed. Thousands of druggists who had thought themselves secure in their method of doing business, were to find themselves lawbreakers in the eyes of the law, if the Government ruthlessly enforced the Act. But wisely, the Government moved conservatively, slowly, yet earnestly and firmly. By official decree the Committee permitted old labels on medicines in jobbers' stocks to be used until October 1st, 1907, providing a "sticker," (pasted slip), stating approximately the amount of the proscribed substances, such as alkaloids, alcohol, chloroform, ether, etc., present, be placed upon each package. These *guess-work* labels, or stickers, are legal until October 1st, 1907. After that time every bottle, carton, and box of medicine, if it conform to the letter of the law, must bear upon it a reconstructed label giving *by assay* the exact amount of all the substances named in Article 28 (See pp. 7-8). It is not sufficient to label the outside of the package only, or the bottle only. *A regulation label must be on each separate container; the bottle, the wrapper, the carton, and the box.* One and all must bear a descriptive label, carrying a statement of fact.

Stickers, Supplemental Label, Stamp, or Temporary Paster.—Pasters or stickers that guess, or approximate, the amount of alcohol, chloroform, or other energetic in a medicine are thus a temporary permit whereby dealers may sell the original, unopened bottle, until October 1st, 1907. The rulings of the Committee allowing these temporary stickers, (Regulation 17), are positive to the effect that October 1st, 1907, all labels must be printed so as to accord with the law, both in form and in substance. Since a sticker, next October, will show that the medicine is at least a year old, and by

inference probably much older, it is questionable whether any physician or pharmacist would accept it after that date, even if he were permitted to do so, or whether any thoughtful manufacturer would care to have his preparations sold under such an authentic label of their antiquity.

Although a dispenser from a sticker bottle can not accurately calculate the amount of alcohol in a prescription from a sticker that merely guesses, the Department will, until October 1, 1907, permit dispensers the latitude of error shown by the sticker.

Sticker Inaccuracy.²—Analyses of the alcoholic contents of a number of preparations to which stickers have been affixed, show the greatest discrepancy and unevenness in the alcoholic contents of the bottles. Nor, with pharmaceutical preparations made by percolation or maceration, can the alcoholic contents be known without accurately assaying each separate preparation each time a new batch is made. A given drug, percolated at different times with the same alcoholic menstruum, if brought to definite *drug* values, will show material alcoholic variations from other batches. Still greater discrepancies must occur with different specimens of the same drug. Indeed, one method of producing an accurate drug value, is to vary the alcoholic proportion. These, and connected facts, such as temperature, extractive matters, varying the menstruum as necessity demands, etc., produce decided alcoholic variations in preparations of the same name, and demand an assay, and a specially printed label for each separate batch. Whoever is unwilling or unable to do this detail work, runs great risk in Interstate Commerce, even with the simple tinctures, alcoholic syrups, and fluid extracts. Bear in mind, too, that

"In the case of alcohol the expression 'quantity' or 'proportion' shall mean the average percentage *by volume* in the finished product."—Regulation 30.

The Committee states that packages not labeled in conformity with the law

"*Shall be corrected by a supplemental label, stamp, or paster.*" Stickers, as a rule, do not *correct*, nor do they correctly give the alcoholic strength. The law is thus not conformed with when stickers deviate, as they do, from 1 per cent to 114 per cent from the alcoholic content."

² Inaccuracy of *assayed* preparations is also possible. Errors may arise in work and calculation. Besides, certain conditions that have never been established may cause moderate variations in result. These do not concern us now, and it is likely that they will be well considered before prosecution is established under the law.

Guarantee.—The Government permits a serial guarantee to the effect that the contents of a package are neither adulterated nor misbranded. This serial number can be used with original packages, the serial number being filed in Washington. This plan many parties have utilized. In some directions the erroneous impression prevails that a serial number is a *Government guarantee* of the intrinsic quality of the preparation stamped. This is not true. The serial number simply authoritatively directs the Government to the manufacturer concerned, when suit is instituted on a defective substance bearing the guarantee. *The Government guarantees nothing whatever.*

Others place a guarantee on each invoice or bill of sale. This amounts to the same thing. In either case, the manufacturer guarantees only the unbroken package, and in neither case is anything outside the original package guaranteed.

Jobbers Have Responsibilities.—Although a manufacturer may have done his utmost to make his labels conform to the new rulings, some jobber, indifferent to his duty, may send out a bottle bearing an old label. No manufacturer authorizes this, and it is done at the jobber's risk. It would be as unfair to ask a manufacturer to pay a fine of that description as to ask the party purchasing the article to do so. Be sure each bottle purchased bears the new form of label, with proper assay figures. (See p. 16.) If a jobber opens and divides a package, his billed fragment of it becomes *the original package*, and he is the responsible party. For this reason, it is to the jobber's interest to stock standard preparations in convenient sized original packages. For the same reason physicians and pharmacists should, by insisting on original packages, both protect themselves and not involve the jobber. Do not ask a jobber to break a package of anything.

Pharmacists and Physicians Have Responsibilities.—The same ruling prevails with the professions. It is the duty of pharmacists who dispense *for inter-State business*, to see that assayed preparations only are employed, and to obey the law relative to the labeling of their newly made packages. Although old stock can be used inside a State, provided the laws of that State do not forbid this, when preparations are to be replenished, it would be wise to insist that every item purchased be in an original, unbroken package, *actually assayed*, with assay figures printed on the label in the location, and by the size type demanded by the law. No dispenser

knows when he will be required to prepare a prescription to be labeled for inter-State commerce, and it costs nothing to be safe. This applies particularly to alkaloids, alcoholics, and to preparations of the other substances named in Regulation 28. (Pages 7-8.)

Insist on Getting Original Packages.—Physicians and pharmacists should, as has been said, take no broken packages of the forbidden drugs. Indeed, it is best to secure original packages of everything possible. An opened package, or a strip label, carries manufacturer's responsibility. It is not a simple question of sophistication or substitution, as formerly, but a question of risk—the *United States Law*. Order original packages, and direct that if not in stock the same substance in the next nearest sized original package be sent.

Imitators Now in Danger.—The law prohibits all form of imitation and counterfeit. If an imitation or a counterfeit or "a fraudulent simulation of any article of food or drug" be sold, and that fact proven, the seller becomes liable. This seems to apply particularly to the imitations of established brands, or of well-known meritorious brands, as well as to substances designed to replace genuine drugs and chemicals. Exceptional care will now be taken by manufacturers to induce dealers to stock convenient sized original packages.

Adulterations and Sophistications.—Already the price of many substances has rapidly increased, because parties heretofore using adulterated products or debased drugs in their preparations, must now purchase the pure. This necessarily increases the expense of those who formerly could obtain pure drugs at less prices than now prevail. The "just as good, but cheaper," man finds that he must not try his motto on the United States Government. In some cases the price of crude drug products has increased from 50 to 100 per cent. In some directions an item can not be bought at any price, if a guarantee is required. Physicians and pharmacists carrying questionable stocks of commercial, cheap drugs, such as are cheaply questionable, will do well not to venture them in inter-State business. The wise man, as soon as possible, will replace all such questionable preparations and drugs with those known to be authentic. As concerns alkaloidal preparations, alcoholics, etc., in original packages, if they have crossed a State line the Government inspectors can take them from any stock, wherever they are found intact, and assay them for action, or use those "which

may be submitted for examination by the chief health, food or drug officer of any State, Territory, or the District of Columbia."

Take Great Care in Corking Broken Packages.—It remains to be seen whether manufacturers will protect any broken package whatever. To do so will be at great risk. Careless corking of alcoholics or evanescent substances will soon change their assay percentages. This is not the fault of the manufacturer. Alterable alkaloids, such as emetine and many organic products, will change by air contact. Thus age becomes a factor that is not the manufacturer's care. Dispensers will surely have to prove the integrity of their mixtures, and unquestionably preserve them, if a manufacturer assumes the risk of the retailer's penalties. Remember, that the manufacturer's guarantee concerns the unbroken package used in inter-State business, and that the Government does not consider an opened package a manufacturer's responsibility.

Use New Corks.—Keep all bottles securely corked, by means of new corks. On opening a bottle, if the cork be spoiled, throw away the fragment and *refit with a good, new cork*. Then see that the cork is tightly replaced each time a part of the material is removed. *Be sure to prevent evaporation*. Do not purchase too large bottles of anything. It is better to stock four quarter-pound vials, than a single pint bottle of any substance, unless it be very stable or used quickly.

Physician's Responsibility.—Do not accept that physicians are immune, or excepted from the law's rulings. Every prescribing physician in America deals, more or less, in the articles mentioned in Regulation 28 (pp. 7-8). Whoever transports across a State line an original bottle of the restricted alkaloids, or alkaloidal drugs, the coal-tar products, such as heroin, eucaïne, acetanilide, or their derivatives, chloroform or alcoholic preparations, is employing the articles regulated by the Government, and must see that they are properly labeled. It is therefore the duty of every physician to know just what to do, and it is his privilege, as a good citizen, to conform to the law.

Wrong Advice.—Beware of the man who tells you that physicians are not concerned in this Law. Your risk is great, should such advice be heeded. For a time the Departments will be lenient with both physicians and legitimate pharmacists. But the wrongdoer will not be permitted to escape under any such cloak, nor will

legitimate physicians be permitted to fit a protective cloak over the otherwise physician.

Whoever comprehends the methods of the Internal Revenue Department, or of the Agricultural Department, knows just what a law-breaker may expect from those authorities when they conclude to act. To catch certain wrong-doers necessitates that physicians be required to obey the provisions of the Act.

An authoritative ruling is made by the Department, as follows:

"If a package compounded according to a physician's prescription be shipped, sent, or transported from any State or Territory or the District of Columbia to another State or Territory or the District of Columbia by a compounder, druggist, physician, or their agents, by mail, express, freight, or otherwise, the label upon such package is required to bear the information called for by Congress."—Food Inspection Decisions, No. 57.

Physicians' Prosecutions Necessary.—It is necessary to the law's vitality, that no one be exempted. Should physicians be excluded from its penalties, the law concerning impostors would fail. Many pharmacists would also be exempted, for numbers of these are physicians. They, too, must come under the restrictive clauses, regardless of either their methods or their products. The greatest harm done the people in the line of distributing narcotic alkaloids, coal-tar synthetics, and harmful secret mixtures, is accomplished by persons sailing under the name *physician*, or by adventurers, who employ physicians in order to get their business legalized. The credit of the profession demands that the name *physician* be not therefore protected in whatever a man calling himself "physician" may wish to accomplish. To do this would protect specialized fraud, on an appalling scale. I accept that the rule that applies to fair pharmacists and otherwise pharmacists, applies alike to fair physicians and otherwise physicians. *The Law and the Rulings must be observed by all who sell restricted substances.*

SPECIAL TO ECLECTIC PHYSICIANS.

Having given a general review of the now celebrated National "Food and Drugs Act," Eclectic physicians may be briefly advised by a summary concerning their special relationships and chief responsibilities. The same rulings, of course, apply to all reputable practitioners.

1st. The law is an outcome of a long period of unfair and

wrongful business methods in which impostors, charlatans, and sophisticators, regardless of name or profession, have been scarcely disturbed.

2nd. The National Law became thus a necessity, and is to be enforced for the best interests of the country.

3rd. All forms of medicines, crude as well as manufactured, and all medicine handlers, are embraced in its restrictions and regulations.

4th. Article 28 (see pp. 7-8) gives in full the list of medicinal agents that must be named (with proportions) on every label carrying any of them into a Territory, the District of Columbia, or inter-State commerce. Physicians should read these names carefully, and familiarize themselves with such as they use.

5th. No adulteration or substitution whatever in any direction is allowed. For example, powdered yellow parilla can not now be mixed with golden seal, and the product then labeled Golden Seal, nor can a fluid extract of the same adulterant be sold for fluid extract of hydrastis, and sold in inter-State commerce. Oil of mirbane can not be substituted for oil of bitter almonds, nor can peach-seed oil be labeled Sweet Almond Oil. Hundreds of such cheapeners are now authoritatively outlawed.

6th. SCOPE OF THE LAW.—Remember that this Government Law affects only the Territories, the District of Columbia, and inter-State commerce. Every filled prescription or mixture *sold*, if mailed, expressed, or shipped across a State line by common carrier, must have the amount, per ounce, of each ingredient named in Article 28, (pp. 7-8), plainly stated on the label, if any such be a constituent. However, as several States have already passed laws based on the Government Act, and many others are preparing to do so, as each State does this, the State law applies to adulterated, misbranded, or sophisticated drugs inside that State, as well as to the Territories, and inter-State commerce.

Physicians May Use a Pen.—Whilst manufacturers are required to print in large type (8-point caps) the names of these ingredients, practicing physicians are allowed to write these amounts on their labels.

"The package may be marked so as to comply with the act by either stamp, pen and ink, or typewriter, *provided all such written matter is distinctly legible and on the principal label, as prescribed by Regulation 17.*—Food Inspection Decisions, No. 57.

Family, or Office Practice.—Family, or office practice, inside a State is not affected. Physicians can fill prescriptions as usual, from old or new stocks of medicines, if they do a legitimate family or office practice inside a State, providing no State law interferes or otherwise regulates the method of prescribing or the medicines prescribed.

Practicing physicians may freely carry their medicines in pocket cases, saddlebags, or in properly labeled original packages, across State lines, or throughout Territories or in the District of Columbia, and prescribe from them to their patients *without labeling them as concerns the contents*. They may also deliver prescriptions or mixtures to patients who must needs carry them across State lines, if the medicine be not sold as a drug. This is the ruling:

"If, however, the patient himself, or a member of his household, or the physician himself carries such package across a State line, and such package is not subject to sale, it is held that such package need not be marked so as to conform with the law, because such a transaction is not considered one of inter-State commerce."—Food Inspection Decisions, No. 57.

Thus it is seen that bedside and office *practice* (not connected with sale of medicines) is unaffected. An Eclectic physician, for example, can dispense his Eclectic medicines from his pocket case, say ten drops of veratrum to half a tumbler of water, without any fear, and can carry his medicines wherever he goes, providing, if he carries original bottles of manufacturers' products across a State line, they be labeled properly, according to the Law. In like manner physicians prescribing coal-tar products, narcotic alkaloids, and other regulated energetics, can act under the Law.

Newly Labeled Preparations Necessary.—Do not purchase prohibited* preparations that do not bear a label with the assay figures printed properly on the bottle, carton and box. A little care in this direction may save much trouble and possible expense. Regulation 17 states that the correct form of label must be on "*any package of a food or drug product or any container thereof*." You run no risk if you are *right*. To comply with the Law is to be right.

October 1st Time Limit.—Manufacturers and jobbers must have their newly labeled preparations on the market October 1st, 1907, or whoever deals in their products will be subject to penalty. Until

* This term relates to all the substances named in Regulation 23. (See p. 7-8)

that date, the guessing stickers, regardless of their errors, can be used by jobbers, and the defective old labels can be used by manufacturers, provided the amounts of the regulated substances are stamped or printed on them as the law directs. Do not be either indifferent or misled. Demand assayed medicines, correctly labeled, in original, unbroken packages, when making purchases. October 1st will soon be here. Take "sticker" goods only when they can not be avoided. You run no risk if you are sure both the label and the contents of a bottle accord with the letter of the Act.

No Danger if Care Be Taken.—1st. If in inter-state practice physicians exercise care regarding future purchases, keep their volatile preparations well corked so as to calculate correctly the contents of mixtures, and under the professional relationships, dispense only to patients, or for patients *without making a charge for the medicine*, there need be no fear whatever of the National Law. If they sell medicines as *drugs* (charge for the filled prescriptions) they come under the Law's restrictions, and must obey it or meet the penalties.

In inter-State practice, physicians can deliver medicines without the regulation label to patients, or to members of patients' immediate families who carry them home across State lines, *providing such packages are not subject to sale*.

2nd. In Territorial or District of Columbian practice, if medicine be delivered by common carrier, and sold as a commercial drug, be sure the label is correct, according to the Law, in form and substance. If the prescription be filled at the bedside by the physician, or otherwise as a part of his professional duty, the medicine is not required to be labeled in the meaning of the Law.

3rd. Physicians can write legitimate prescriptions regardless, and mail the written prescriptions to be filled anywhere in the United States. This is not *selling a drug*.

Only 4 Eclectic Preparations Affected.—The Eclectic preparations used internally carrying a prohibited narcotic, are *Diaphoretic Powder*, or (*Compound Powder of Ipecac, Opium and Camphor*) and *Sudorific Tincture*, or (*Compound Tincture of Serpentaria*). These preparations have long been official in the Eclectic Dispensatory. The first contains nineteen grains of opium to the ounce. Hence, *Diaphoretic Powder*, if sold as a drug, in a Territory or in inter-State prescription, needs be labeled, "*Contains 19 grains Opium to the Ounce.*" The second, *Sudorific Tincture*, (*Compound*

Tincture Serpentaria), contains 10 grains Opium to the ounce, and if sold as a drug in inter-State commerce, or the Territories, must be labeled accordingly.

Two external Eclectic remedies contain morphine sulphate, *Ophthalmic Balsam*, (1 grain morphine sulphate to ounce), and *Mild Zinc Ointment*, (2 grains morphine sulphate to ounce). These must likewise be labeled with their morphine content, when prescribed in inter-State commerce and in the Territories.

Not an Eclectic remedy carries a secret narcotic or heart depressant, nor does one contain a coal-tar synthetic. Not an Eclectic remedy has been changed in composition in order to conform to the National Law, nor is it necessary that one be so changed.

DIRECTIONS FOR LABELING PRESCRIPTIONS AND MIXTURES.

Narcotics, etc.—The Committee explicitly directs that the amount of every substance named in Regulation 28, shall be given in its relationship to the ounce, not to the dose, so that old time labels on tablets, pills, capsules, etc., do not now apply.

I do not know how pills and tablets of indefinite weight, regardless of the amount of active ingredient in each pill or tablet, can, without being weighed, be labeled so as to conform to the law. Manufacturers have not heretofore considered the amount of sugar or other excipient in a tablet or pill as a factor to be weighed and named. Hence the seller must necessarily weigh the tablets or pills, and from the gross weight calculate the proportion of alkaloid to each ounce. For example, by using different amounts of sugar, $\frac{1}{2}$ grain of morphine sulphate may be made either into a tablet weighing 5 grains, or into one weighing 1 grain. In the first case the prescription would carry $\frac{1}{5}$ the amount of morphine to the ounce carried by the second.

Nor do I know how any exception to the Law in favor of either pills or tablets can be made. The Law is mandatory to the effect that the amount of the named substances in an ounce must be named on the label. It is evident that with pills or tablets the label must carry both the amount of the regulated ingredient in each, and also the amount per ounce of the regulated ingredient.

The alcohol must be estimated in terms of *Absolute Alcohol*, by Volume, not commercial alcohol. To illustrate the application of this law to physicians' prescriptions, let us take a few examples.

First, where the prescription covers two or more ounces. To obtain the proportion per ounce for each of the articles named in Regulation 28, divide the entire amount of the substance used by the number of ounces.

EXAMPLE 1. The prescription carries 6 grains Morphine Sulphate to a 4 ounce vial. The label must state that each ounce contains $1\frac{1}{2}$ grains Morphine Sulphate.

(Write the directions for use as usual).

EXAMPLE 2. The prescription carries 1 ounce Chloroform to an 8 ounce liniment.

The label must state that each ounce contains $\frac{1}{8}$ ounce Chloroform.

(Write the directions for use, as usual.)

Second. Where the prescription carries only the fraction of an ounce the following rule may be adopted for estimating the proportions to be given on the label.

Rule. Find the total number of grains in the mixture (including everything in the prescription).

Multiply 480 (the number of grains in the Apothecary's Ounce) by the number of grains of the regulated substance used, and divide by the total number of grains in the prescription.

Remark. Bear in mind that the new law demands that the ingredients regulated must be stated in their proportion to the OUNCE, not to the DOSE. THIS IS TRUE OF ALL DRUGS AND CHEMICALS.

EXAMPLE 1. The prescription carries,
60 grains Extract Cannabis Indica.
120 grains Extract Hyoscyamus.

To be made into 60 pills.

The label must state that each ounce carries 180 grains Extract Cannabis Indica. (Hyoscyamus is not named in Article 28, and its amount need not be given on the label).

The computation is made thus :

Extract Cannabis Indica, ...	60 grains.
Extract Hyoscyamus, ...	120 grains.

Total, ... 180 grains.

$$\frac{480 \times 60}{180} = 160.$$

EXAMPLE 2. The prescription carries,

Powdered Opium, ...	10 grains.
Sugar Milk, ...	60 grains.
Subnitrate Bismuth, ...	60 grains.

To be made into ten pills.

The label must state that each ounce carries 37 grains Opium. The computation is made thus :

Powdered Opium, ...	10 grains.
Sugar Milk, ...	60 grains.
Subnitrate Bismuth, ...	60 grains.

Total, ... 130 grains.

$$\frac{480 \times 10}{130} = 37. \quad (\text{Number grains Opium per ounce}).$$

EXAMPLE 3. The prescription carries

Acetanilide, ...	24 grains.
Bicarbonate Sodium, ...	80 grains.
Powdered Sugar, ...	80 grains.
Total, ...	144 grains.

$$\frac{480 \times 24}{144} = 80.$$

The label must state that *each ounce* carries 80 grains Acetanilide.

EXAMPLE 4. The prescription carries,

Powdered Opium, ...	5 grains.
Acetate Lead, ...	5 grains.
Tannic Acid, ...	10 grains.
Coca Butter, q. s.	

To be made into five 30 grain suppositories.

The prescription calls for $5 \times 30 = 150$ grains, of which 5 grains are Powdered Opium.

$$\frac{480 \times 5}{150} = 16.$$

The label must state that *each ounce* carries 16 grains Powdered Opium.

PREScriptions CONTAINING ALCOHOLIC PREPARATIONS.

Bear constantly in mind that the term "*Alcohol*" means *Absolute Alcohol*, by Volume, and as such all manufacturers must estimate it and label the bottle. Here, too, the ingredients regulated must be stated in proportion to the Ounce, not the Dose, or the quantity of medicine in the bottle.

(There is a slight contraction in volume, when alcohol is mixed with water, but this is inappreciable in such small amounts as prescriptions.)

EXAMPLE 1. The prescription carries in a 4 ounce mixture 1 ounce of a given liquid, labeled 80% Absolute Alcohol. The alcoholic percentage is $\frac{1}{4}$ of 80%, or 20%.

The physician's label must state that *each ounce* contains 20% Absolute Alcohol.

(Write the directions for use as usual.)

EXAMPLE 2. The prescription carries,

$\frac{1}{2}$ ounce of a tincture, 50% Alcohol,
$\frac{1}{2}$ ounce of a tincture, 80% Alcohol,
3 ounce Simple Syrup.

The Alcoholic percentage is estimated thus :

$\frac{1}{2}$ ounce tincture 50% Alcohol	$= 50 \times \frac{1}{2} = 25\%$ (Alcoholic per cent).
$\frac{1}{2}$ ounce tincture 80% Alcohol	$= 80 \times \frac{1}{2} = 40\%$ (Alcoholic per cent).
3 ounce Simple Syrup	$= 00$ (Alcoholic per cent)
4 ounces mixture	65% Total percentage.

Each ounce carries $\frac{1}{4}$ of 65%, = 16%

(If the fraction remaining after the division is less than $\frac{1}{2}$, it is neglected. If $\frac{1}{2}$, or more, add 1.)

The physician's label must state that *each ounce* contains 16% Absolute Alcohol.

To obtain the Alcoholic Percentage of Each Ounce in a given Prescription Carrying Two or More Ingredients :

Rule. Multiply the alcoholic percentage of each ingredient by the number of ounces (or fraction of an ounce) used.

Find the sum of all the percentages thus obtained, and divide by the total number of ounces in the mixture.

The fraction remaining after division is neglected if less than $\frac{1}{2}$; if $\frac{1}{2}$, or more, add 1 to the quotient.

The prescription carries,

$8\frac{1}{2}$ oz. Neutralizing Cordial, 12% Alcohol = $12 \times 8\frac{1}{2} = 42\%$ Alcohol

$\frac{1}{2}$ oz. Tincture Geranium, 25% Alcohol = $25 \times \frac{1}{2} = 12\%$ Alcohol

4 oz. Mixture, contains, ... 54% Alcohol

Each ounce contains one-fourth of 54% = 14%.

EXAMPLE 3. The prescription carries 8 ounces, 80% Alcohol, in a 4 ounce mixture.

$$80\% \times 8 = 240\%.$$

$$240\% \div 4 = 60\%.$$

The physician's label must state that each ounce carries 60% Absolute Alcohol.

EXAMPLE 4. The prescription carries,

$\frac{1}{2}$ oz. 20% Alcohol = 10%

1 oz. 40% Alcohol = 40%

2 oz. 80% Alcohol = 60%

3 oz. 10% Alcohol = 30%

$6\frac{1}{2}$ oz. contains . . . 140%

Each ounce contains 140% divided by $6\frac{1}{2}$ ($= \frac{13}{2}$) = $140 \times \frac{2}{13} = 22\frac{2}{13}\%$

The physician's label must state that each ounce contains ~~22~~ $22\frac{2}{13}\%$ Alcohol.

EXAMPLE 5. The prescription carries,

1 oz. 40% Alcohol, ... = 40%

4 oz. 8% Alcohol = 8×4 , ... = 32%

3 oz. 32% Alcohol = 32×3 , ... = 96%

8 oz. Water, (No Alcohol), ... = 00

16 oz. Mixture, contains 168%

Each ounce contains $168\% \div 16$, = 11%.

The physician's label must state that each ounce contains ~~11~~ $11\frac{1}{4}\%$ Alcohol.

Remember. When physicians prescribe at the bedside, no label is necessary. When physicians fill prescriptions in their office and deliver same to patients or members of their immediate family, no label is necessary. When physicians professionally prescribe, the written prescription can be mailed or delivered to anyone to be filled by apothecaries.

However. If physicians sell medicines carrying the substances regulated by the Law, they become sellers of medicines. Such mixtures cannot be sent across State lines by common carrier without being labeled as the Law demands, nor can such commercial sales be made inside Territories or the District of Columbia without the proper label.

TO ECLECTIC PHYSICIANS.

Excepting alcoholic compounds, only four Eclectic preparations contain drugs that come under the Pure Food and Drug regulations. (See pages 17-18 this pamphlet.) These are,

Diaphoretic Powder.

Sudorific Tincture.

Ophthalmic Balsam.

Mild Zinc Ointment.

If you do an Inter-State practice, or prescribe within a Territory or the District of Columbia, Remember the above items, and conform to the law.

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MANGIFERA.

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The accompanying treatise is part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of Materia Medica, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressly for these fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional.

The history, description, pharmacy and chemistry, will be written by John Uri Lloyd.

Back numbers of these studies will be supplied physicians and pharmacists, on application, as long as they are in print; but as we make no remedial agents for the public, and are opposed to the encouragement of self-medication by the people, we can not supply them to persons outside the professions.

Mangifera Indica is one of the most important and reliable remedial agents of the tropics. Thirty years' experience of physicians versed in Materia Medica and Therapeutics has demonstrated its exceptional value in its established field. Possibly no other remedy has the same kindly action and pleasant taste, without any bad after effect whatever. The Specific Medicine is carried in stock, in original packages, by every jobbing druggist in America.

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1/2-lb. "	\$1.40 "	Not mailable.
1-lb. "	2.75 "	Not mailable.

The Treatise on The National Pure Food and Drug Act is the most comprehensive study yet printed, in its relationship to physicians, and its historical importance. Every physician should read it carefully, and should file it away for reference.

A TREATISE ON LIBRADOL.

An External Remedy for Pain.

The Therapeutic Uses are written for this Treatise by PROFESSOR FINLEY ELLINGWOOD, M. D., Chicago, Ill.

The Specific Indications and Uses are by PROFESSOR H. W. FELTER, M. D., of Cincinnati, Ohio. (Back Cover.)

The General Comments on the Drug Constituents are from the writings of PROFESSOR ROBERTS BARTHOLOW, M. D., PROFESSOR EDWIN M. HALE, M. D., PROFESSOR JOHN M. SCUDDER, M. D., and from Scientific literature generally.

The History, Chemistry and Pharmaceutical Record, (Libradol in Pharmacy), are by JOHN URI LLOYD, Phar. M.

- Treatise No. I embraces Thuja Occidentalis.**
- Treatise No. II embraces Cactus Grandiflorus.**
- Treatise No. III embraces Pilocarpus (Jaborandi.)**
- Treatise No. IV embraces Veratrum Viride.**
- Treatise No. V embraces Chionanthus Virginica.**
- Treatise No. VI embraces Asepsin and Asepsin Soap.**
- Treatise No. VII embraces Collinsonia Canadensis.**
- Treatise No. VIII embraces Nux Vomica.**
- Treatise No. IX embraces Gelsemium.**
- Treatise No. X embraces Belladonna.**
- Treatise No. XI embraces Oenanthe Crocata, Vegetable Caustic and Crataegus.**
- Treatise No. XII embraces Ergot.**
- Treatise No. XIII embraces Macrotys.**
- Treatise No. XIV embraces Dioscorea.**
- Treatise No. XV embraces Development of the Pharmaceutical Still.**
- Treatise No. XVI embraces Scutellaria [in press].**
- Treatise No. XVII embraces Mangifera Indica and The National Pure Food and Drug Act.**
- Treatise No. XVIII embraces Libradol.**
- Treatise No. XIX will embrace Sulphurous Acid, Hydrochloric Acid, Carbolic Acid, Sodium Sulphite and Sodium Phosphate.**

Drug Treatise, Number XVIII.

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Libradol in Pharmacy.

Preliminary.—When Libradol was introduced, notwithstanding the established value of its component drugs and the reports of physicians employing it, the uses, in some directions, were announced with cautious conservatism. However, several years have passed since that date, and the reports of numbers of physicians of unquestioned experience and integrity have firmly established both its field of usefulness and its limitations, thus permitting a permanent record to be made in this number of the series of Drug Studies. Professor Finley Ellingwood, M. D., whose rational hopes in behalf of what such a remedy as Libradol would do, as shown in his article, led to the experimental evolution of this excellent pain reliever. He tersely, and yet comprehensively shows, by a thorough treatise, where it can be used in confidence, and also where it is contra-indicated. The field of painful affections it beneficially covers will be seen to be very large, whilst the limitations are very few.

Selection of the Name.—The trade mark name *Libradol* was created for this preparation by Dr. Ellingwood, from two Latin words, *Liber* and *Dolor*, signifying *pain* and *its relief*, because of the immediately conspicuous influence the preparation exerts when applied to a painful part. But, as Dr. Ellingwood states, this must not divert the attention of the physician from the fact that all the processes of a local inflammation are, as a rule, beneficially and materially influenced by its application.

As a Pharmaceutical Preparation.—The sanitary plasma Libradol, must not be classed with the simple glycerin dressings. It is a homogeneous, highly medicated, and exceedingly potent compound, in plastic form, but in every way different from the glycerin-clay applications, advertised to the profession as poultices, for general use. It carries the energies of its drug constituents and the high antiseptic qualities of *Laurus Camphora* and *Melaleuca*, it not only neither ferments nor putrefies, but possesses decided antiseptic qualities. Libradol has a green color, a fragrant, aromatic odor, and a smooth unguent-like consistence. It can be spread on paper or on soft muslin or directly on the affected part. It can be removed by washing with water, leaving the skin clean and natural. It neither irritates nor inflames the part to which it is applied.

The Drug Influence of Libradol is necessarily different from that of any known single member of the *Materia Medica*. But yet,

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no mystery either in medicine or of pharmacy is claimed as a part of its composition or process of manufacture. It is a thing peculiar to itself, the result of the study of the drugs from which it is derived and compounded. These drugs may be studied at leisure by whoever cares to do so, for they are defined and described in every comprehensive Materia Medica, Pharmacopœia and Dispensatory.* Their dominant qualities may be briefly recorded as follows:



SANGUINARIA CANADENSIS.

From Baillon, Botanique Medicale.

Sanguinaria Canadensis.—A low perennial plant, common to rich bottom lands of the Middle West, thence east and north. The root has a yellow, acrid juice of alkaloidal composition and peculiar odor. Its alkaloidal constituents are complex, but all are marked by being white when pure, and producing red or yellow salts. It was used by the Indians of North America as a pigment to paint the face and arms, and also as a remedy. It came into early domestic and botanic use among the American settlers, and has ever been a valued drug with eclectic physicians, entering into many of their old time compounds. It is a powerful remedy in respiratory disorders, but owing to its energy must not be given in heroic doses.

Capsicum Annuum.—A bushy herb about two feet in height. It was discovered in South America, and thence introduced to Europe and Asia about the beginning of the sixteenth century. The medicinal part is the fruit or pepper pod, which is too well known to require description.

An oleo-resin, an oily-like substance, carries the acrid qualities of Capsicum. Capsicum contains volatile substances, generally overlooked, that give the odor and flavor, but yet are distinct from pepperness. These principles have not been therapeutically differentiated, physicians accepting that the virtues of Capsicum reside altogether in the pungent and acrid constituents. As a stimulant Capsicum has the power of neutralizing depressant remedies like Lobelia and Tobacco. Libradol is free from the pepper side of Capsicum.



CAPRICUM ANNUM.

From Atlas Pharmacæutischen Botanik.

*More than ten thousand volumes in the Lloyd Library treat more or less fully of the drugs composing Libradol.

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Nicotiana Tabacum.—Introduced into Europe from America in 1492, this herb is now an artificial necessity with millions. It is a potent drug whose medical



NICOTIANA TABACUM.

From Baillon, Botanique Medicale.

qualities have been neglected by reason of its common uses. Its qualities depend largely on alkaloidal constituents and volatile structures of complex composition and relationship, especially when altered by destructive distillation. It has powerful acro-narcotic properties. Muscular relaxation and trembling of the extremities indicate an over-influence. The alkaloids of this drug are too energetic to be used alone and too depressant to be employed pure. Notwithstanding the general impression, Nicotine is but one of the characteristic educts capable of being obtained from this drug. Our association of its desirable constituents with those of Lobelia, in connection with the modifying influence of Capsicum, Melaleuca, and Laurus Camphora, permits its use in Libradol as would not be possible were it to be employed alone.

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LOBELIA INFLATA.

Reduced cut from Flora of Northern States and Canada.

Lobelia Inflata.—An American herb, found in open fields over a large part of our country. The seed and the whole plant are used, the former being most active. Since the day of Samuel Thomson, Lobelia has been a favorite of physi-



DRACONTIUM FOETIDUM.

Reduced cut from Flora of Northern States and Canada.

cians acquainted with its qualities. Its characteristic chemical constituents are alkaloidal, but it contains pungent, volatile substances. Its power to relax the whole system when taken internally and to affect a part when applied locally, are remarkably characteristic, as is its power to stimulate the sympathetic system. In over dose nausea and emesis result. Its best known field is that of a remedy in respiratory affections. In this connection, the uses by Professors Kimball, Scudder, and Hale, and the physiological investigation of the alkaloid made by John Uri Lloyd for Prof. Roberts Bartholow, published in *Drugs and Medicines of North America*, 1884, are most interesting. Capsicum, Melaleuca, and Laurus Camphora, as shown in Libradol, counteract the excessive relaxative and depressant effects of the useful constituents.

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Dracontium Fœtidum.—A low, spreading, American swamp plant. It has a fetid odor, and is very offensive. The root of the plant is the part used in medicine, and for a hundred years has borne a high reputation with physicians conversant with its virtues. The offensive odor has, however, prevented Dracontium from reaching great popularity, although this odorous principle is of no therapeutic value. The drug is acrid to the taste. Dracontium acts upon the nervous system, relieving irritation, promoting normal functional activity. It is faintly narcotic, being successfully used in diseases due to nervous irritability. We consider it a neglected drug of great possibilities. Its offensive volatile constituent is not present in Libradol.



MELALEUCA LEUCODENDRON.
From Baillon, Botanique Medicale.

The oil is largely adulterated, and is even altogether fictitiously substituted by sophistication. It has a green color and a penetrating odor, and is a powerful stimulant, diaphoretic and antispasmodic. In India, applied locally, it is valued as a remedy in Rheumatism and in Palsy. It is especially valuable in Chronic Laryngitis and Bronchitis. The great value of Melaleuca in Libradol is its quality of modifying and controlling the action of the associated energetic constituents of the drugs which reduce congestion and inflammation, but which would otherwise be too depressant.

Melaleuca Leucodendron.—An aromatic tree of India, yielding a stimulating oil of a camphoraceous odor.



LAURUS CAMPHORA.

Laurus Camphora.—A Japanese forest tree of peculiar aromatic odor and

From Baillon, Botanique Medicale.

warming taste. It yields an aromatic oil and the sublimate, camphor, which is a stearopten. In large doses this stearopten is narcotic; in small doses sedative and anodyne. "Very small doses stimulate, and large doses depress."—Felter. It allays nervous excitement, subdues pain, and arrests spasm. Its field of usefulness is very extended, but in Libradol the object is not for its direct object so much as that of an invaluable supporter of Melaleuca in the direction of that plant's influence. By means of these correctors the full value of these potent remedies becomes possible in Libradol.



CEPHÆLIS IPECACUANHA.
Cut from Guibourt Drogues.

Cephælis Ipecacuanha.—A half-shrubby, perennial Brazilian plant found in hot, moist, shady locali-

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ties. For several hundred years it has been used in medicine, and like all other valuable drugs of vegetable origin, was introduced empirically. The root is the part employed, and varies greatly in quality. Its conspicuous alkaloid is very easily destroyed under unkind treatment. One of its conspicuous qualities is that of relieving gastro-intestinal and broncho-pulmonic irritation, and inflammation "no matter what the disease may be."—*Felter*. In this sense its investigation was undertaken as a constituent of Libradol.

THERAPEUTIC USES OF LIBRADOL.

BY FINLEY ELLINGWOOD, M. D., Chicago, Ill.

Its History in Therapy.—Libradol has now been before the profession about seven years. From the confidence our entire school has in Lloyd Brothers and their products, it was at the start adopted almost universally, and has been in constant use by several thousand physicians, who have watched its effects so closely and have established its field so clearly that we are now enabled to give it a fixed place in our therapeutics.

In the consideration of the physiological action of the agents which enter into the essential constitution of this substance we find two distinct groups of remedies, the first of these being classed by physiological investigators as motor-depressants, while the second class possesses peculiar stimulating properties. In the first class are lobelia, tobacco, sanguinaria, ipecac, and dracontium. In the second class are capsicum, melaleuca, and laurus-camphora. The two last named drugs are also antiseptic and antifermentative. The happy combination of these two groups comprehends a most fortunate union of action by which the influences of each remedy are retained and any undesirable influence of the depressants is antagonized.

Evolution of Libradol.—Before the days in our school of the study of the specific action of each drug, the Fathers, following the example of the profession at large, endeavored to secure satisfactory results by combining several remedies with reference to their known therapeutic action. A few of these compounds are now established as firmly as are simple remedies. Among the early Eclectic compounds thus produced, was that known as the compound Lobelia Powder, made of lobelia, sanguinaria, dracontium, ipecac and capsicum. This has been a favorite remedy for nearly a century.

Among the many uses of this powder, was that of applying it to the chest in acute pneumonia, or broncho-pneumonic difficulties, of whatever character, and so marked and immediate was its influence, not only in controlling the inflammatory processes involved and in

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preventing the results of inflammation, but in the immediate control of pain, which was always so salutary and satisfactory, that casual observers remarked upon its influence, and often gave the powder all the credit for curing the disease in a most satisfactory manner.

I had, at one time, an experience which forcibly impressed upon my mind the fact, that the family would give the total credit of the cure to this powder. A child in a very conspicuous and worthy Jewish family, was attacked with broncho-pneumonia. The attending regular physician, of the same nationality, and now one of the well known physicians of Chicago, called in on the second day a prominent consultant. On the third day one or two others were called in; on the fourth day I was called for one purpose alone, which was, to tell the total consultant faculty what powder it was that I used in a similar case, on a little cousin of the patient, which powder had immediately aborted the entire group of symptoms.

When I named the powder to the celebrated faculty, and described its constitution and method of application, the disgust with which they received the information so impressed my mind, as to suggest to me the necessity of putting these constituents into a more cleanly, a more scientific and a more accessible form, for ready, sanitary and convenient applicability. I felt as if the pharmacy of an effective remedy was in disgrace. I knew that the remedy would be of immense benefit to the patient under consideration, but the idea of a crude brown powder, mixed with lard, or hog fat, was in no way acceptable or justifiable, to either the Jewish patrons, or to the professional gentlemen in consultation.

I gave the matter a great deal of thought, and finally concluded that it should be possible to combine the energetic structural constituents of the separate remedies of which the powder was composed, with some easily absorbable, clean, animal or vegetable oil, and this with some base which would give the preparation about the constituency of an ordinary plastic dressing.

I immediately wrote Professor Lloyd, stating to him my convictions, and asking him to undertake this matter. With his usual carefulness, and with the hesitancy of all true scientific investigators, he replied in a manner that showed that he had some reluctance in promising success in the undertaking, but after several letters between us, he finally undertook the work, and after careful experimentation, and with the addition to the original formula of the modifying and fortifying agents necessary to the structural perfection and antiseptic preservation of the compound, he succeeded, as I was confident he would, not only in producing a sanitary combination which

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accomplished all that the original powder accomplished, but in increasing the known virtues of the compound and in adding to the virtues of that powder, the power of controlling pain, wherever located, and of materially abating the processes of inflammation and of assisting in the restoration of the normal condition of diseased parts. This, too, without using any form of grease or oil whatever, to become rancid and foul and to gaud the patient.

Not a Home Remedy for the Laity.—So energetic are the medicinal properties of Libradol that it can not be placed indiscriminately in the hands of the patient or its application left to the judgment of non-professional patrons, but, like potent remedies described for internal use, it must be used strictly as advised by the physician. It can not, and will not, be submitted to the laity.

Its Application.—It may be laid down as a general rule that the time in which Libradol may be allowed to remain on will depend largely upon the area of absorbing surface involved or upon the nearness or remoteness of the painful area to or from the nerve centers. In the application of Libradol, if immediate results are desired, it is a good plan to first apply a very hot, moist towel to the part for a few minutes, thoroughly moistening the skin and stimulating an active capillary circulation. On removing the towel, the skin should be dried from the excess only of moisture, and the Libradol applied immediately, while the skin is yet hot and moist. However, it can be applied at any time without any preparation whatever.

Pain.—In the study of the action of drugs we define as *specific* those which possess a marked influence more or less invariable upon some exact condition.

In the consideration of all the factors involved in its definition, pain is by no means a simple or exact condition. If it were always caused by a lesion of a single sensory nerve, the matter of its treatment would be greatly simplified. Nerve involvement is, of course, the real cause of the condition, but the condition is usually induced by the primary involvement of all the structures to which the branches of a nerve, or nerves, are distributed. In this involvement which thus includes both the nerves and the contiguous structures so many pathological factors are included, that we have, as yet, no single remedy that comprehends in its influence even a small portion of these factors.

Opium and the Narcotics Induce Nerve Insensibility. Without Correcting the Cause of Pain.—By the use of opium or its alkaloids, or of chloroform, cocaine, or other ~~neral~~ or local

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anesthetic, we may destroy or suspend nerve sensibility, but unfortunately, in many cases, this does not always modify or abate the actual pathological conditions involved, nor does it retard the serious advancement of these processes.

Libradol Relieves Pain by Removing the Cause of Pain.

In the study of the physiological action of many drugs, it was found that the constituent remedies in this combination exercised a most salutary influence, not only upon the sensibility of the nerves involved, but upon the capillary circulation within the diseased area, the muscular structures therein included, and, subsequently, upon the course of the advancement of the congestive and inflammatory processes, and upon secretion, exudation, adhesion, induration, hypertrophy, suppuration and excretion. This, indeed, is a great deal to endeavor to accomplish by one combination, and had not experience proved beyond doubt the remarkable influence of this remedy, we would hardly have the confidence, assurance or courage to claim that so much could be accomplished.

The Province of the Constituents of Libradol Defined.—

Of the remedies named (page 2) as belonging to the first class, each exercises an influence in abating nerve sensibility. If closely studied it will be found that some of them, however, influence the motor nerves more than the sensory, while others materially abate nerve sensibility. Tobacco is distinctly a paralyzer of the afferent nerves, but at the same time it acts upon the peripheral filaments of the efferent nerves.

It would seem that paralysis of sensation was the thing to be desired, but suspension of motor power—cessation of motility—is sometimes essential, also, in the reduction of pain. In all injuries muscular irritation, muscular contraction, spasm, rigidity, determination of blood and capillary engorgement are, all combined, an important factor in inducing the pain. The muscular conditions contribute to the local engorgement by preventing the escape of the blood from the capillaries.

This class, acting thus on both the motor and the sensory nerves, will directly abate pain, reduce muscular tension, and relieve muscular irritation. It will enforce muscular relaxation, and thus promote a free circulation within the capillaries. This latter influence is as important upon the processes of congestion, secretion, exudation, hypertrophy, and excretion as is the immediate suspension of nerve sensibility, and this influence is materially and essentially promoted by the agents of the second group.

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The Mode of Action of Libradol is the Antithesis of that of Opium and Narcotic Anesthetics.—The remedies which are commonly used for the control of pain are objectionable because they usually interfere materially with secretion and excretion; or they abate at once, more or less fully, the functional action of the essential organs of the body; or they suspend the essential nerve activity. Another objection to their use is that they cover up or hide the evidences of the existing inflammatory or other disease processes, without retarding the progress of these processes, thus permitting the advance of the disease without the physician's knowledge. Libradol in no way interferes with secretion or excretion. In fact, it materially promotes normal excretion and tissue metabolism, which is very essential in the restoration of local inflammations. Neither does it influence organic functional activity to any material extent, nor does it in any way exclude a perfect knowledge of the processes of, or of the diagnosis, or of the progress of the disease.

Specific Indications.—Acute localized pain is the most conspicuous indication for Libradol. Acute pain in the chest; general soreness in the bronchial tubes; cough, with soreness; dry, persistent cough; tightness of breathing, without pain or soreness; dry, asthmatic breathing; sthenic dyspnea; acute inflammation in the chest; acute localized congestion or inflammation in any part; persistent local pain; neuralgias; lumbago; sciatica; articular rheumatism; acute joint injuries, etc. Pain of local origin which induces reflex conditions, or which results in remote pain, is relieved by applying the remedy to the area in which the pain originates. It may at the same time be applied over the course of the nerve which conveys the painful sensation.

Contra Indications.—Extreme feebleness with depression; feebleness of the heart's action, with small, feeble and rapid pulse; shock; persistent depression, with nausea or vomiting; general relaxation; depression of the circulation, with subnormal temperature.

Therapy.—Many of the specific conditions named, for which Libradol may be used with good results, will be found as a part of the phenomena, often, of acute inflammatory disorders. This is especially true of such disorders as pneumonia, pleurisy, bronchitis and croup,—disorders affecting the respiratory apparatus,—also glandular inflammations, such as tonsillitis, parotitis, mastitis, ovaritis, orchitis, hepatitis, nephritis, and local intestinal inflammation. To these may be added the various neuralgias, with cardiac neuralgia, and angina pectoris.

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When Indicated in Pneumonia.—In pneumonia the influence of Libradol upon the pain and inflammatory processes, is immediate and pronounced; but in adjusting the remedy to the different cases of pneumonia, bronchitis, or bronchopneumonia, close attention must be paid to the general condition of the patient, to the stage of the disease, and to the susceptibility of the patient to the depressing action of this compound. In the incipient stages of all cases, it may be used. In the early stage of actual inflammation in sthenic cases it is of much value. But when the disease has progressed until there is depression of the heart or nervous system, I should hesitate about using Libradol or any other heart depressant, but should apply simple persistent heat. However, others have used it with care in the advanced stages, with benefit.

Relief Immediate in Pleuritis.—In pleuritis, the relief from pain, and the freedom of the respiration which occurs, is so immediately pronounced, that the patient is overjoyed, and attributes the result, at once, to its real cause. It need not be kept applied long, after the pain disappears, but may be reapplied if there is a recurrence of the pain.

Anticipating Acute Bronchitis.—If there is any one condition in which I have obtained especially good results from Libradol, it is that which every patient describes as a severe cold in the chest. This is manifested by tightness in the chest, difficulty of breathing, rapidly progressing soreness, dry, hoarse, distressing cough, as local symptoms. These are usually accompanied with malaise, chilliness, some headache, and ultimately a rise of temperature. While these symptoms are premonitory of acute bronchitis, they may be allayed without the development of marked inflammatory symptoms, by the application of Libradol to the chest, hot, and by measures calculated to restore general secretion. I have insisted, in many cases, on these patients remaining in bed for twenty-four or thirty-six hours, with Libradol applied to the chest, a large portion of the time, with the application of heat, by means of a rubber water bag, the entire time, and have cured the difficulty without further measures. In the treatment of acute bronchitis, no one who has used Libradol, will consent to be without it.

In Pulmonary Congestion and Croup.—In all painful pulmonary congestions, as stated, it should be applied hot, and in sthenic cases, the application may be permitted to remain until slight nausea appears.

In croup I have obtained good results from the application of this agent. Where the attack comes on in the night, with the usual

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alarming symptoms of hoarse, barking, metallic cough, with fever and a high degree of nervous excitement, I have applied Libradol to the throat and the area of the larger bronchi, and obtained prompt results. I have had several cases in which the patient went to sleep after the application of this remedy, where there were no evidences of the disease afterward. Many other physicians confirm the above observations.

In Spasmodic Asthma.—In difficult breathing from any cause, where there is no depression, this application will give some relief; but in spasmodic asthma the pronounced relief which usually appears within a few minutes is most gratifying. There is general relaxation, easy breathing, a relief from cough, a fuller, slower pulse, and an inclination to sleep. It seems to loosen the bronchial secretions and promote free expectoration. In cases where there are periodical asthmatic paroxysms, the recurring paroxysm is milder, of shorter duration, and more readily controlled.

The Soreness of Tonsilitis, Ovaritis, and Orchitis.—In tonsilitis Libradol will not be needed except in those cases in which the swelling is very great, and yet it abates the general soreness in the throat, both in tonsilitis and in pharyngitis. In parotitis it relieves the pain, produces a softening of the hardened gland, and promotes the action of the indicated remedies. In mastitis its influence is almost immediate, and as yet it has not seemed to retard the normal secretion of milk, more than is necessary for the recovery of the gland. In ovaritis and orchitis, the active, painful and inflammatory processes are quickly influenced.

In Local Inflammatory Processes, such as Appendicitis.—No single remedy, or combination of remedies to which we have access, is of greater service in appendicitis, than Libradol. I have confidence enough in its influence, from frequent and persistent use, to believe that its application covers an important part of the ground that can be covered by medication, in this serious disorder. It antagonizes the inflammatory processes, relieves muscular tension, and promotes normal capillary action. This influence is nowhere more apparent than in this disease.

In general peritonitis, excellent results are obtained from the use of Libradol, but it can not be applied over the entire peritoneal surface, as there is so large an absorbing surface. In this case, it can and should be applied oftener, and for a much shorter period.

For several years, I have applied Libradol thoroughly over the area of tenderness, in all cases of local or circumscribed peritonitis.

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It may be said that Libradol seldom, if ever, produces immediate depression, and often thoroughly controls all pain before nausea or other depressing influence is observed. Consequently, there are cases accompanied with severe pain, in which the contra indications for the remedy are present, where it may be applied for a short time, greatly relieving the pain before any depressing influence is exercised. In these, it should be removed as soon as the pain is relieved.

Enteritis, Hepatitis and Splenitis.—In enteritis, with diffused soreness and pain, Libradol is applicable only in the manner described immediately above. In hepatitis and splenitis it will be found of much service.

Acute Nephritis.—I have not had an opportunity to use this application in that form of acute nephritis which occurs from cold, where the symptoms of invasion are plainly apparent and similar to those of other acute inflammations, but I should certainly expect an immediate influence, not only upon the pain, but upon the inflammatory processes and upon the secretion of urine.

As an Adjunct to Specific Treatment in Arthritis.—In arthritis, especially of rheumatic origin, the specific remedies must be given internally, as indicated, but the external use of Libradol will give the patient immediate and continued relief, and because of the remoteness of the area its application can usually be long continued, or it may be frequently renewed, or may be applied with persistent heat.

It is used to great advantage in either the acute or sub-acute forms of this disease, but the chronic forms are not so satisfactorily treated with it, as here its influence is not permanent. A number of cases of gout, with pain in the great toe, or joint, or bones, pain in a very circumscribed area, have been immediately and permanently relieved by it.

To Control Pain in Neuralgia, Lumbago, and Sciatica.

Regarding its use in the treatment of the various forms of neuralgia much may be said. Various forms of neuralgia, such as sciatic, toothache and facial neuralgia have been relieved by it. While in the treatment of the pain of tic douloureux

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reux, there are usually local and constitutional conditions present, in acute cases, that demand other specific treatment. It has controlled the pain of both acute and chronic forms of lumbago, and has been of material assistance to a complete cure which was accomplished by the use of other remedies. It has relieved many cases of sciatica, both those of recent occurrence, and some that were chronic and persistent in character.

In Localized Pain.—In the treatment of localized pain, in a nerve or at its origin, or pain which seems to involve the entire nerve, or which extends along the course of the nerve, or which is diffused into the muscular structure from a painful nerve, it will be found of much service. This includes neuralgia of all of the nerves of the face, with the supra-orbital pain and toothache, with swelling, also subscapular neuralgia, the various forms of tic, intercostal neuralgia, pleurodynia, gastrodynia, and also mild cases of the pain of gall stone.

Sensitiveness, Soreness and Spinal Tenderness.—I have had excellent results from Libradol in the treatment of extreme sensitiveness, soreness, or tenderness of the spinal cord, and spinal ganglia—commonly described as spinal irritation. My patients suffering from this difficulty have borne the application unusually well, and have been enabled to make frequent and prolonged reapplication with only good results. It certainly produces a general sense of tranquillity, as there is nearly always more or less general nerve irritation or nervous excitement, with these patients, with remote pain, headache, and general discomfort. Abatement of these, together with the main symptoms, has usually been the result of the application of Libradol. The influence of internal medication in all cases, is more plainly apparent, more permanent, and more quickly induced, when the pain is controlled and the soreness relieved by Libradol.

In Sprains, Swollen Joints, and Bruises.—In surgical conditions, there is frequent demand for a pain relieving remedy of this character. Injuries to the joints, sprains, and severe bruises are directly within the field of its operation. A severely sprained ankle, knee, or wrist, with or without extreme swelling, and accompanied with the usual pain and tenderness, are better treated with Libradol, than with any other known application.

In open wounds, which accompany injuries of any character, or bruises, there is no advantage in applying the substance in the wound, but after the wound is cleansed and dressed with an antiseptic dressing, especially if there is much swelling, Libradol can be applied with great advantage. After the reduction of a dislocation, if the joint be

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exposed, the application of Libradol will at once relieve pain and assist in the restoration of the normal condition of the contiguous structures. In case of severe simple, or comminuted fracture, where the application of a fixed splint must be delayed for a few hours, until the swelling abates, nothing will exercise a more salutary influence upon the swelling and pain, than Libradol.

Tumors and Ulcerations.—Other conditions to which this application may be made are painful tumors of any kind, painful developing carcinoma, painful ulcerations of bone, and in one case I obtained good results where it was applied to chronic tibial ulcer.

Rigid Os Uteri.—If a small quantity be applied by touching the tip of the finger covered with Libradol to a rigid os uteri the relaxation will take place rapidly and satisfactorily. There are some cases of painful labor, with general muscular rigidity and very irritating pains, which are of no assistance to the labor, where a free application of Libradol across the lower abdomen, or to the perineum, especially if undilatable and rigid, or across the sciatic region, will be soothing, relaxing, and in every way beneficial. As soon as its relaxing influence is apparent the plaster should be removed.

Notice.—Libradol is an energetic remedy, and should not be plastered thick, like a poultice. A thin skim, spread evenly, will produce its palliative effect.

LIBRADOL MILD.

This preparation is a mixture of the unmedicated base of *Libradol* and its stimulating constituents excluding the energetic drugs. It has no positive drug energy, other than that of ordinary glycerin magmas, which are well known and altogether too feeble to be relied on in either important cases or in acute pain. It is prepared in response to inquiries for a mild medicament to use topically with infants or to incorporate with Libradol when a modifying effect is desirable in super-sensitive persons. In croup, pneumonia, etc., where continued applications are necessary over a large surface after the effect of *Libradol* is obtained, Libradol Mild is desirable as an after-dressing. It is invaluable as a dressing for burns and scalds, but preparations such as this can not be compared in efficacy with the energetic Libradol. Libradol Mild needs be spread thicker than Libradol, but like Libradol it will not dry or crumble.

Useful as a stimulating application in croups, etc., after Libradol is produced its effect.

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LIBRADOL.

(A Remedy for Pain.)

To relieve pain without the use of opiates, anesthetics, or powerful internal drugs is an ideal of the professions. To discover a remedy capable of doing this by direct local application to the seat of the affliction has long been the hope of physicians and the object of pharmacists.

INDICATIONS AND USES OF LIBRADOL.

BY H. W. FELTER, M. D.

Libradol is not a cure-all, but has two definite fields of action, viz.: the relief of disease conditions presenting—

I. Pain and Inflammation, with or without exudation, as in Pneumonia, Bronchitis, Croup, Pleurisy (with or without effusion), Ovaritis, Orchitis, Tonsillitis, Acute Pharyngitis, some forms of Rheumatism (inflammatory) and Boils.

II. Localized Pain, along nerve courses, in joints, and in the muscular structures, as in some forms of rheumatism (sub-acute, non-inflammatory, articular, etc.), Lumbago, Facial Neuralgia, Subscapular Neuralgia, Intercostal Neuralgia, and Pleurodynia.

Specific Indications.—Pain, with or without swelling or inflammation; inflammation with serous or mucus exudation; sharp lancinating pain in chest, aggravated by respiratory or other movements; congestion and engorgement of parts; dyspnoea; soreness in pectoral region; dull, aching pain; subcutaneous and thecal inflammations; pain of syphilitic nodes.

PRICE.

LIBRADOL.

Pound Package, ...	\$1.50	Not mailable.
Eight Ounce Package, ...	.80	" "
Four " "	.45	By mail, 60c.
Hospital Size (5 lb.), ...	6.50	

MILD LIBRADOL.

Pound Package, ...	\$1.00	Not mailable.
Eight Ounce Package, ...	.55	" "
Four " "	.30	By mail, 45c.
Hospital Size (6 lb.), ...	4.50	

Respectfully, **LLOYD BROTH**

A TREATISE

ON

Sulphurous Acid, Hydrochloric Acid, Carbo- lic Acid, Sodium Sulphite, Sodium Phosphate, and Ferri Acetas.

The Therapeutic Uses of these preparations are from the writings of JOHN. M. SCUDDER, M. D., HARVEY W. FELTER, M. D., and JOHN W. FYFE, M. D.

The comparison of the keeping qualities of the Sulphurous Acids, is by MISS MARGARET STEWART, A. M.

The chemistry, pharmacy and history, are by JOHN URI LLOYD, Phar. M.

- Treatise No. I embraces *Thuja Occidentalis*.
- Treatise No. II embraces *Cactus Grandiflorus*.
- Treatise No. III embraces *Pilocarpus (Jaborandi.)*
- Treatise No. IV embraces *Veratrum Viride*.
- Treatise No. V embraces *Chionanthus Virginica*.
- Treatise No. VI embraces Asepsin and Asepsin Soap.
- Treatise No. VII embraces *Collinsonia Canadensis*.
- Treatise No. VIII embraces *Nux Vomica*.
- Treatise No. IX embraces *Gelsemium*.
- Treatise No. X embraces *Belladonna*.
- Treatise No. XI embraces *Oenanthe Crocata*, Vegetable Caustic and *Crataegus*.
- Treatise No. XII embraces *Ergot*.
- Treatise No. XIII embraces *Macrotys*.
- Treatise No. XIV embraces *Dioscorea*.
- Treatise No. XV embraces Development of the Pharmaceutical Still.
- Treatise No. XVI embraces *Scutellaria* [in press].
- Treatise No. XVII embraces *Mangifera Indica* and The National Pure Food and Drug Act.
- Treatise No. XVIII embraces *Libradol*.
- Treatise No. XIX embraces Sulphurous Acid, Hydrochloric Acid, Carbo-lic Acid, Sodium Sulphite, Sodium Phosphate and Ferri Acetas.
- Treatise No. XX will embrace *Cupri Acetas*, *Carbo Vegetabilis* and *Triturated Podophyllin*.

Drug Treatise, Number XIX.

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Acids, Inorganic Salts, AND Miscellaneous Preparations.

Introduction.—Many persons ignorant of the methods and principles of Eclectic physicians have accepted that the Eclectic Materia Medica is altogether vegetable, and that Eclectic physicians oppose the use of all mineral agents. Whilst it is true that the clinical investigations of the Eclectics have been mainly with plants and plant products, it is no less true that many such inorganics as acids, alkalis, and other agents far separated from plant products, are to them invaluable. The same is likewise true of such animal products as cantharis, apis mellifica, and tela araneæ. No Eclectic physician would consider his assortment of remedies complete without every item considered in this drug treatise, and especially so as concerns the well-known inorganic salts. One has but to study the pages of the Eclectic works on Therapy and Materia Medica to be impressed with the detailed consideration each salt or acid of the inorganic section has received at the hands of the Eclectic profession. Whilst all are of more or less importance, a few that have proved themselves exceptionally useful, or are possessed of exceptional qualities that have given them conspicuous places in Eclectic therapeutics, have been placed in the list of Specific Medicines. These are the subject of consideration in the pages that follow.

ACIDS.

Introduction.—Although most acids are sour to the taste and turn blue litmus paper red, this is not true of all members of the class of acids. Some are even sweet to the taste, and others too indifferent to affect litmus. In like manner, various members of the class have most positive characteristics as individuals, ranging from the grateful Citric, Acetic, and Tartaric Acids to the astringent Tannic Acid, the corrosive Sulphuric Acid, and the deadly Prussic Acid. Consequently the acids must be studied individually for their specific qualities, and as such, beginning about 1870, a few, invaluable in the special fields, have been established in Specific Medication. In

SULPHUROUS ACID.

general introduction to the subject of Acids in therapy, Dr. Scudder, 1870, wrote as follows concerning Hydrochloric and Lactic Acids:

"There is a *specific* use for acids in the treatment of disease which we wish to study carefully. In any form of disease we may have an excess of the alkaline salts of the blood. This may be the basis of diseased action, or but a complication rendering it more intense, but whether the one or the other, it needs to be recognized and have direct treatment.

"The indications of excessive alkalinity are very plain, and need not be mistaken by the youngest practitioner. The color of the mucous membranes is *deep red*, especially of mouth and tongue; the coating of tongue, sordes, or any exudative material has a dark color, usually brownish. It makes no difference what the diseased action is, in its totality, or what it is called, the *deep red*, somewhat *dusky* color, always demands the administration of acids.

"There is but one exception to this, and that is a rare one, in which the excess is of soda, but with a defect of potash. In this case the administration of a salt of potash will answer a better purpose than the acid, or may be combined with it.

"Muriatic acid is preferable in most cases, and should be used so diluted and in such quantity as to be pleasant to the patient, and continued until the indication for its use is removed. Lactic Acid is sometimes preferable with children, and in some cases of chronic disease of adults, especially when associated with indigestion. The vegetable acids may be used in acute disease, but are not as good as those named."—*Specific Medication*.

This introduces the special acids, of which the first in importance is Sulphurous Acid, which we reproduce from Drug Treatise No. XIV in order to place it with related preparations.

SULPHUROUS ACID.

(*Specific Medicine.*)

History and Qualities:—It has long been known that the "vapor" of burning sulphur possesses powerful bleaching qualities, is very irritating, and is destructive to life, especially its lower forms. Its power of arresting fermentation by "killing the yeast," and its value in certain disease expressions, dependent on the destruction of minute living organisms, has been a matter of general information from a very early period. Pliny is authority for the statement that the ancient Greeks and Romans utilized it in these directions.

So-called "vapor" of burning sulphur is not, however, the vapor of sulphur, but a gas SO_2 that results from the union of sulphur and oxygen. This gas is known as sulphur dioxide or sulphurous acid gas. It is very suffocating when inhaled, is destructive to coloring matters and lower forms of organic life. When it is passed into water, the two unite, molecule to molecule, ($\text{SO}_2 + \text{H}_2\text{O} = \text{H}_2\text{SO}_3$), the solution being known as Sulphurous Acid. This is in reality a compound in which the sulphurous acid radical, SO_3 , unites with basic

SULPHUROUS ACID.

hydrogen to form Hydrogen Sulphite which corresponds to the other sulphites. Thus,

Sulphurous Acid (Hydrogen Sulphite)	- -	H_2SO_3
Sodium Sulphite, - - - - -	- -	Na_2SO_3
Potassium Sulphite, - - - - -	- -	K_2SO_3

Sulphurous Acid can also be made by other methods, such as the decomposition of a sulphite by means of sulphuric acid, or by depriving Sulphuric Acid (H_2SO_4) of one atom of oxygen by means of hot charcoal. This latter process is the Pharmacopoeial method of making the official solution, which carries not less than 6 per cent of its weight of sulphur dioxide.

By either method, however, it rapidly parts with its SO_2 gas, if it be exposed to the air, and also does this with varying rapidity when vials containing it are opened in the usual course of business. Besides, by the absorption of oxygen, part of the H_2SO_3 becomes sulphuric acid, H_2SO_4 , which contaminates the remainder. For these two reasons, even though it be prepared with great exactness, these subsequent changes result finally in its utter demoralization.

Sulphurous Acid was introduced into Eclectic practice at an early date. The first edition of "Specific Medication" (1870) carried explicit directions for its use, and Eclectic physicians commend it extensively in all their literature. But, the uncertainty of the commercial preparations which, especially in warm weather, become very weak even to worthlessness, was a cause of great complaint and much concern.

In this direction, the manufacturers, likewise the dispensers, were powerless, because of the fact that, like other evanescent preparations, it possessed its original qualities, at but one period of its existence, viz., the instant it was finished. It can be safely asserted that no specimen of U. S. P. Sulphurous Acid that has been uncorked and dispensed from, will stand the test thereafter. In order to overcome this trouble as much as possible, we experimented in the line of various solvents and menstrua, and at last devised a basic menstruum, a sulphited sulphite, which holds its final SO_2 persistently. This preparation will not deteriorate beyond a certain degree, and it carries a large amount of its sulphite radical to the last drop.

The following experiments by Miss Margaret Stewart show the change that followed the exposure of the Specific Medicine Sulphurous Acid in an open graduate as contrasted with aqueous sulphurous acid under parallel conditions. For the purpose of comparing the results the Pharmacopoeial strength (6 per cent SO_2) was taken as the unit, or 100 per cent, the result obtained by each assay being reduced to this standard.

SULPHUROUS ACID.

SULPHUROUS ACID.				SPECIFIC MEDICINE SULPHUROUS ACID.			
June 28th,	98 per cent,	-	-	-	-	107 per cent.	
" 29th,	75 "	-	-	-	-	99 "	
July 1st,	18 "	-	-	-	-	73 "	
" 28th,	2 "	-	-	-	-	46 "	

A like series of assays was made, of Sulphurous Acid and Specific Medicine Sulphurous Acid taken from 4 ounce corked bottles, as found on the pharmacist's shelves. This gave even more striking results than those tabulated herein.

The experiments demonstrate that when the commercial acid became valueless, the Specific Medicine carried as a sulphite radical, enough SO_2 to exert its marked influence. It is colorless, irrespirable, and can be applied to the skin without injury.

From the Specific Medicine label we extract as follows:

"Qualities:—As originally made, like all other solutions of Sulphurous Acid gas, this preparation became less reliable as time passed, and ultimately lost all its sulphurous qualities. In order to correct this defect, we devised a basic menstruum, which retains indefinitely, in combination, a decided amount of sulphurous radical. Specific Medicine Sulphurous Acid carries a permanency that now permits it to be used in confidence that to the last drop in the bottle, the effect of this combined sulphite radical can be obtained."

Since the aforementioned process was devised, no complaint whatever has ever been made of Specific Medicine Sulphurous Acid, which is the standard with Eclectic physicians. The following papers on the therapy of this proposition give its field of usefulness.

THERAPEUTICS OF SPECIFIC MEDICINE SULPHUROUS ACID.

From Specific Medication, by DR. JOHN M. SCUDDER.

"We consider Sulphurous Acid in the class of sulphites, rather than under the head of acids. We employ it as an anti-zymotic, and a parasiticide, and not for the common purposes of an acid, though here, as in the case of the alkaline sulphites, there must be the general indications for an acid, as there was with them for an alkali.

The Sulphurous Acid, like the alkaline sulphites, specifically antagonizes zymotic causes of disease. It is well to keep in mind the fact that this is something more than simply arresting or modifying the septic process, for we have already seen that the zymotic influence frequently destroys the life of the fluids and solids without producing putrescency. We prescribe sulphurous acid as an anti-zymotic in cases which present reddened mucous membranes, with brownish coatings of tongue and sordes. Given the indications for the use of an anti-zymotic, with the indications for the use of an acid, and we select the Sulphurous Acid.

SULPHUROUS ACID.

Sulphurous Acid may be employed in yeasty vomiting, in aphthous mouth and throat, or wherever the presence of microscopic fungi is suspected, with the same certainty as the sulphite of soda. We also use it in porrigo, trichosis of scalp, and pityriasis versicolor, with excellent results. As a local application it should be diluted with from two to six parts of water.

I wish to call especial attention to its use in some diseases of the throat, by the spray or atomizing apparatus. In diphtheria, with dark redness of mucous membranes, and fullness with relaxation, there is no local remedy equal to Sulphurous Acid spray. It is equally beneficial in those cases of cynanche maligna, with dark redness of mucous membranes. Whilst in ordinary sore throat from cold, with dusky discoloration, it offers one of the best local applications in the materia medica."

To the foregoing may be added the very complete article by Professor Felton in The American Dispensatory, as follows:—

Medical Uses and Dosage:—The characteristic condition calling for Sulphurous Acid is one of a low state, with normal or increased redness of the tongue and membranes. The tissues are enfeebled, full and relaxed, and appear to have lost vitality; the pulse large and empty, the sensation under the finger being that of a large calibred vessel with a small stream of blood. The secretions are nasty, dirty, and exhale, as well as the breath, a peculiar, sweetish, mawkish odor. The membranes are reddened and dirty, or muddy in color. The tongue is characteristic, being coated over red, with a glutinous, nasty, yellowish-brown, or the coating may be transparent; and again, it may appear, as if fecal matter had been rubbed upon it. In later stages a moist, glutinous, brownish fur may line the center of the organ. Occasionally the tongue is sleek and shining, like a piece of raw beef. Dirty sordes upon the teeth and lips; and the saliva is increased in quantity, viscid, and mawkish. When externally indicated, as in *erysipelas* and like conditions, the tissues are deep red, and appear to have lost vitality. The erysipelatous redness blanches more or less as the disease progresses, "sometime in the center, sometimes at the border, sometimes in the deep structures, you see and are looking through the superficial redness" (Scudder, Spec. Diag. 90). *Wounds and abrasions* seem to show a tendency to slough, and are bathed in dirty, sticky, unhealthy secretions. Added to these a depraved state with *yeasty vomiting*, and you have the uses for one of our most important antiseptics.

Sulphurous Acid has been largely employed as an external application in all *cutaneous parasitic affections*, and in which, before its application, the scabs have been removed, so as to have the diseased surface directly exposed to the agent. For this purpose it may be applied pure, or diluted with glycerin or water, of the required strength. The use of glycerin, however, should be guarded, as it often acts as an irritant to the skin, as well as doing injury by abstracting water from the tissues, leaving them hard and dry. *Tinea tonsurans, versicolor*, and *favus*, *urticaria, scabies, ringworm*, and *purpura*, are successfully treated with it. As a wash, or in the form of a spray, it has been found effectual in *thrush, diphtheria*, (with dusky coloration of membranes), *follicular pharyngitis, clergymen's sore throat, chronic irritation of the larynx and vocal cords, weakness or loss of voice* from the preceding cause, *chronic bronchitis, pertussis, asthma, wounds, and ulcers*. In these conditions it should be used internally also. *Mucous patches, tonsillitis, and mercurial stomatitis*, when having the characteristic indication, yield promptly to this acid. As an application to *sloughing wounds and ulcers, with sticky, glutinous secretion*, it is of marked value. Give it internally at the same time.—Am. Disp.

HYDROCHLORIC ACID.

SPECIFIC USES AND INDICATIONS.

Uses.—Specific Medicine Sulphurous Acid is an anti-zymotic and a parasiticide. As an anti-zymotic it is indicated in cases presenting reddened mucous membranes with brownish coatings of tongue and sordes. It may be employed in yeasty vomiting, in aphthous sore mouth and throat; wherever microscopic fungi are suspected. As a local remedy it is useful in porrigo, trichosis of scalp, and pityriasis versicolor. By spray it is used in diphtheria with dark redness of mucous membranes, and in ordinary sore throat from cold with dusky discolorations.

Indications.—"Full, relaxed, dirty looking tissues, with deep redness and sticky, unhealthy discharges; sweetish, mawkish odor of breath and discharges; saliva increased and viscid; tongue full, broad, atonic, normally red, with glutinous coat, either transparent or dirty brownish, with effaced papillae; unhealthy, viscid wounds and ulcers; gastric derangements with yeasty fermentation. All the conditions are those of sepsis and debility."—Am. Disp.

Dose:—

℞. Sp. Med. Sulphurous Acid,	- - - -	3j
Water,	- - - -	3iv

MISCE.—Teaspoonful at a dose. As a local application it is diluted with from four to twenty parts of water and applied freely.

HYDROCHLORIC ACID.

(Specific Medicine.)

Description.—Acid Hydrochloric, Specific Medicine, is a dilution of Hydrochloric Acid, and can be used in confidence that it is free from arsenic and all other metallic impurities. In the form established under the Specific Medicine label, it has for thirty years been a favorite with Eclectic physicians, and maintains its reputation, increasingly, with physicians of other schools who know its value, and use acids for their specific actions. The field of Hydrochloric Acid is given as follows, by Dr. Felter:

THERAPEUTICS OF SPECIFIC MEDICINE HYDROCHLORIC ACID.

General Action.—"Hydrochloric Acid, when administered in small doses, creates gastric warmth and quickens the circulation. Decided intoxicating effects may be induced by it, while salivation may result from its continued use. The concentrated acid is violently irritant and corrosive, though it does not attack flesh as energetically as sulphuric acid. A poisonous dose produces intense burning pain, and the faucial, cesophageal and gastric tissues are discolored. The tongue is swollen and intensely red, with occasional whitish patches. Great restlessness ensues, with a dry, feverish skin, sunken features, dilated pupils, small,

HYDROCHLORIC ACID.

irregular, wiry pulse, collapse and death resulting. Vomiting of bloody matter may occur, though more frequently, only violent retching takes place. Whitish vapors may be evolved by mouth, if the acid be recently swallowed. The acid may be identified if these vapors produce a flocculent, white material, when brought in contact with ammonia water. After death, the gastric tissues show marked evidence of intense inflammation. The poison is antidoted by the alkalies, preferably calcined magnesia. If possible, emetics and alkaline carbonates should be avoided, on account of their liability to rupture the already softened stomach, by the over-distension, occasioned by the copious liberation of carbonic acid gas. Chalk, whiting, soap, and oil, are also antidotes to poisonous doses of hydrochloric acid, combating the gastro-enteritis in the usual way.—*American Dispensatory*.

Dr. Fyfe writes of Hydrochloric Acid as follows:

"The indications for Hydrochloric Acid are usually seen in typhoid fever, and frequently in the advanced stages of diseases which have a tendency to develop typhoid conditions. This acid is also a good remedy when the secretion of gastric juice is scanty, if administered after meals. When given before meals it arrests the secretion of gastric juice. It is, therefore, a useful agent when such secretion is excessive, if given before eating. It should always be administered in a liberal quantity of water, and if used in large doses should be taken through a glass tube to prevent its injuring the teeth.

"**Dose.**—Specific Medicine Hydrochloric Acid, 5 to 40 minims well diluted with water."—*Essentials Mat. Med., Fyfe*.

The most complete article, embracing the Specific Therapy of this acid, is that of Dr. Felter, as follows:

Specific Action.—"In the use of this agent, we are governed by the specific indications, which are, a deep-red mucous membrane, with a tendency to decay of the tissues, a marked depravation of the body fluids, as is evidenced by the raw, slick, beef-like tongue, or the dark-red or dusky, dry and fissured tongue, and the tendency to dark, brownish coloration and deposits, as sordes, upon the lips, teeth and tongue. All the exudations have a dark color. The temperature may be high and yet sedatives fail to act. With these conditions, the acid acts kindly, the temperature falls, and the way is paved for the administration of other indicated drugs. These conditions may obtain in low states of any of the *fevers*, from continued to typhoid. Hydrochloric acid is more often indicated in *acute*, than in *chronic* diseases, and here it is, that its effects of allaying irritation and acting as an antizymotic are marked. In *digestive disorders*, it is especially applicable. The gastric juice itself, contains this acid, and the cases requiring it, are those in which the secretion of the natural acid is deficient. There may be nausea, vomiting, pyrosis, and stomatitis, greasy yellow, or brown eructations, with a bitter, unpleasant taste; and the breath is pungent and hot. These, together with the characteristic coloration of the membranes, point clearly to its use, whether it be a simple *indigestion*, or advanced *dyspepsia*. *Intestinal indigestion, fermentative diarrhea, catarrhal intestinal disorders of children, malignant dysentery, or any* bowel disorder, with deep-red membranes and tendency to blood disintegration, are alike improved under its use. *Pneumonia, rheumatism, and diphtheria occa-*

CARBOLIC ACID.

sionally need hydrochloric acid. In *phthisis* it checks septic changes, and acts as a tonic in the processes of digestion and assimilation. *Purpura hemorrhagica*, *hepatic disorders*, and *erysipelas* are benefited by it, when indicated. Webster calls attention to the fact, that when the dark-red coloration of membranes is due to cardiac complications, or other conditions tending to imperfect decarbonization of the blood, the mere indication, 'red coloration,' does not hold good. As specifically employed, the dose of the acid (pure or diluted), should be such that the aqueous dilution should be pleasantly sour; it may be sweetened, if desired."

Specific Indications and Uses.—Deep-red, dry, and contracted tongue, with a brownish coating; tongue contracted, with a central brownish stripe, or with a fissured, brownish coat; sordes; membranes dark red; or the tongue is dark or dusky red, moderately full and slick, having the appearance of a piece of spoiled beefsteak; pungent heat of skin, slow digestion, and nervous prostration."—*American Dispensatory*.

The dose of Sp. Med. Hydrochloric Acid varies from 10 minims to a fluid drachm, which should be added to 4 or 6 fluid ounces of water, and sucked through a quill or glass tube, to prevent its injuring the teeth.

CARBOLIC ACID.

(Specific Medicine.)

Acid Carbolic, Specific Medicine, one of the first of the Specific Medicines, is a preparation of Crystallized Carbolic Acid that will dissolve in water, in any and all proportions, and possesses the peculiar, smoky odor of the best Carbolic Acid.

Therapeutics of Specific Medicine Carbolic Acid.—(From the Specific Medicine Label.) "Specific Medicine Carbolic Acid has a wide use as an antiseptic agent and local anesthetic in all cases in which a local cleansing and pain-relieving agent is to be used. The indications for its local use are fullness and relaxation of tissues. It is a good antipruritic.

Internally, it is specifically adapted to fetid eructation and discharges, particularly in gastro-intestinal fermentation. It is also a remedy when ammoniacal urine is present. Whether in acute or chronic diseases, in typhoid or other fevers, in diphtheria, diarrhea, dysentery, or catarrh, it is useful only when the tongue is broad and moist and the breath cadaverous.

Topically, as an antiseptic and stimulant, it is indicated if there be fullness and relaxation of tissues, but not where there is contraction, shrinking, and dryness. Under these rules, it may be used, diluted, for erysipelas, burns, chancre, vaginal injection, and gonorrhea or gleet.

Specific Use.—A remedy for diseases of the digestive canal, at-

INORGANIC SALTS.

tended by irritation and fetid discharges from the bowels; and as a general antiseptic. Locally, for its stimulant and antiseptic influence.

Dose.—℞ Sp. Med. Carbolic Acid, gtt. v to 3i. Syrup or water, ℥iv. M. Sig.—A teaspoonful every three hours.

Local Use.—One part of Specific Medicine Carbolic Acid to from five to forty parts of water."

INORGANIC SALTS.

Alkalies.—Under this term Dr. Scudder included also the salts of the alkaline metals, especially sodium chloride and sodium sulphite, which he considered as alkali derivatives, one of them (*sodium sulphite*) having an alkaline reaction. His introduction to these substances as a class is instructive, and may be studied to advantage. We therefore reproduce it, as follows:

"It is well to consider the *specific* use of alkalies in this relation: as they are the opposite of acids. We may say of these, as of acids, that their deficiency is found as a constituent element in all forms of disease—in some cases being the basis of a morbid action, in others but a complication; but, whenever found, an important element and demanding direct treatment.

The symptoms of deficiency of these salts of the blood, are very plain, and, using the language of the Prophet, 'He who runs may read.' The tongue is broad and pallid, its coating pasty and white, or yellowish white. The mucous membranes are uniformly pallid. As these evidences are absolute and readily determined, it is not necessary to name others not so constant.

Whenever we find this deficiency of the alkaline salts, we will observe, as the result: loss of power in the stomach, enfeebled digestion and slow absorption, impairment of the circulation, arrest of nutrition and waste, and enfeebled innervation. These correspond in degree to the deficiency.

So marked are these results, that I have long regarded the diagnosis, with regard to excess or deficiency of the alkaline salts, as of the highest importance. Indeed, in some forms of disease, especially of a typhoid character, it is the principal element upon which a successful treatment is based.

Soda is the natural salt of the blood, and exists in the body in the largest proportion. Whenever, therefore, we have the evidence of deficiency of the alkaline salts, and no special symptoms indicating others, we will give a salt of soda. In many cases, I order bicarbonate of soda in water, in such quantity that it will make a pleasant drink, and let the patient have it freely.

If, at the same time, we wish an antiseptic influence, we may give the sulphite or hyposulphite of sodium, or the chloride of sodium.

I am satisfied that I have seen patients die from deprivation of common salt during a protracted illness. It is a common impression that the food for the sick should not be seasoned, and whatever *slop* may be given, it is almost innocent of this essential of life. In the milk diet that I recommend in sickness, common salt is used freely, the milk being boiled and given hot. And if the patient cannot take the usual quantity in his food, I have it given in his drink. This matter is so important that it cannot be repeated too often, or dwelt upon too long.

The most marked example of this want of common salt I have ever noticed,

SODIUM SULPHITE.

has been in surgical disease, especially in open wounds. Without a supply of salt, the tongue becomes broad, pallid, puffy, with a tenacious pasty coat, the effusion at the point of injury serous, with an unpleasant watery pus, which at last becomes a mere sanies or ichor. A few days of a free allowance of salt would change all this, and the patient would get along well.

A salt of *potash* is indicated where there is feebleness of the muscles to a greater extent than can be accounted for by the disease. Occasionally such want is expressed in a marked manner by feebleness of the heart.

Ammonia, occasionally proves the best salt for temporary use, especially where there is great debility. But when so used, it should be followed by the free use of common salt, or some salt of sodium."

With these preliminary remarks, we will introduce Sodium Sulphite, which has, for thirty years, been increasingly valued as a most important member of the class of inorganic Specific Medicines.

SODIUM SULPHITE.

This is a colorless salt, having an alkaline reaction and a taste that leaves in the nostrils an after sensation like burning sulphur. It parallels sulphurous acid in its action, and possesses certain advantages in some directions. It can be prescribed in the form of a powder, to be dissolved as the patient desires, or can be applied directly, as a powder, to a surface needing its sulphurous influence. Besides, its alkaline qualities have a direct bearing in some directions. It is so weak a compound as, on the one hand, to be easily dissociated, thus liberating its radical, SO_2 , and on the other hand, to absorb oxygen from the air, changing to Glauber's Salt, or Sodium Sulphate. The crystallized Sodium Sulphite of commerce carries exactly its weight of water, which not only hastens the change into Glauber's Salt, if it be exposed to air, but makes it liquefy in warm weather, if the bottle be closed. These difficulties were overcome in the early record of the Eclectic Specific Medicines, by efflorescing the salt before it was bottled, thus, not only making it about twice as strong, and correspondingly better, than the official form, but also keeping it reliable Sodium Sulphite to the last grain in the bottle.

Specific Medicine Sodium Sulphite of the quality named, has, for over three decades, been the standard with Eclectic physicians, and is an important remedy in the specific treatment of disease. Dr. Scudder, in *Specific Medication*, referred in a general way to this agent, as follows:

THERAPEUTICS OF SODIUM SULPHITE.

"In the part of this work devoted to Alkalies, will be found the general indications for the use of alkaline salts. They are very distinct, and cannot be mistaken—pallid mucous membrane white coating on the tongue.

"We employ the Sulphite in, as the antizymotic, where there are the

SODIUM SULPHITE.

indications for the use of an alkaline salt, as above. As a general rule, the indications for this salt are—pallidity of mucous membranes, with a thick, pasty, white or dirty-white fur upon the tongue.

"The influence of zymotic causes of disease on the fluids and solids is not well understood, but we know that it impairs their life, even if it does not cause more rapid sepsis.

"In some cases this impairment of vital power is all the change that can be noted, retrograde metamorphosis progressing more slowly than in health or ordinary disease. But the remedies we are studying are more than *antiseptics*—they antagonize the zymotic cause, whether it produces sepsis or not.

"In local diseases from a zymotic cause, as diphtheria, cynanche maligna, some forms of catarrh and influenza, erysipelas, surgical fever, etc., sulphites exert their specific action when locally employed, as well as in their internal administration. The indications, however, must be as named above—pallidity with pasty exudates upon tongue.

"Their action in arresting the growth of microscopic fungi, and during diseases arising from this cause, is specific. In yeasty vomiting, presenting *sarcina ventriculi*, the disease is speedily checked by the Sulphites. In some forms of aphthous sore mouth and throat, speedy relief is given by their local application. Some chronic skin diseases are rendered very stubborn by these minute growths, and here also, the Sulphites will prove valuable."—*Specific Medication*, 1870.

Dr. Ellingwood, in his *Materia Medica*, views Sodium Sulphite as an important agent, locating its field of usefulness after the indications by Dr. Scudder, as follows:

"Specific Symptomatology.—Scudder laid great stress upon the use of this remedy when there is pallor of the tissues of the tongue, which is broad and coated with a dirty fur, or with a whitish or yellowish thick, moist coat.

"This agent prevents fermentation in the gastro-intestinal canal. It is specific for vomiting of frothy or yeasty matter. The microscopic fungi, *torula cerevisiæ* and *sarcina ventriculi* are present in this vomited matter. Under these circumstances, the cause being removed, nervous excitement abates, the pulse and temperature are reduced, digestion and appropriation are encouraged. The condition may be present in all acute, eruptive, or inflammatory fevers. It should not be depended upon to fulfill other than the conditions named. The other evidences should be met in each case with the properly indicated remedy.

"Therapy.—When the indications for the use of the remedy are present with general indisposition, without the presence of any recognized disease, this agent alone may be all that is necessary for a cure.

"In aphthous conditions of the mouth, or of other mucous surfaces due to parasitic causes, this agent acts with extreme rapidity.

"A solution of this salt is sometimes applied to foul-smelling ul-

SODIUM PHOSPHATE.

cers, to phlegmonous abscesses where vegetation is apt to be present, or where gangrene is threatened.

"In the treatment of smallpox, erysipelas, and in some cases of typhus and typhoid fevers with all the indications present, this agent performs a very important service."—*Ellingwood's Materia Medica*.

The specific uses and dose of the Specific Medicine Sodium Sulphite are given on the label, as follows:

"Specific Medicine Sodium Sulphite is the direct remedy for that very common condition met with in many forms of disease shown by the broad, pallid, white, or dirty-white coated tongue, associated with a fetid or mawkish breath, although the latter is not always present. The exudate upon the tongue is pasty, and fermentative and putrefactive processes are at work. While these conditions are met in many disorders, they are particularly observable in typhoid and other fevers, in fermentative dyspepsia, ptomaine poisoning, tonsillitis, erysipelas, smallpox, and many forms of sore throat. It is a splendid remedy in sick headache, with white tongue. Locally, it is a valuable remedy in herpes and in scabies, ringworm, and other parasitic diseases.

"Specific Use.—Arresting the septic process; indicated when the tongue is broad, mucous tissues pallid, exudations light and pasty.

"Dose.—Specific Medicine Sodium Sulphite, grs. x to grs. xxx. Dissolve in a tablespoonful of water, and take every two or three hours."

SODIUM PHOSPHATE.

This salt, in Eclectic Specific Medication, long antedates its present popularity in other sections of medicine. Indeed, it is probable that the proprietary medicine-makers, who now rely on it as the principal ingredient of their secret laxatives and their cathartic solutions, learned of its qualities from Eclectic literature.

The commercial Sodium Phosphate is crystallized, carrying one and one-half times its weight of water. In warm weather it is prone to deliquesce in the bottle, forming a glass-like mass at the bottom; if exposed to the air it effloresces, becoming coated, more or less deep, with a white crust. These disturbances were overcome in Eclectic Medicine by using the exsiccated salt, which is thus made much more active, grain for grain, than the Pharmacopœial preparation. This process also overcomes the disadvantages of both efflorescence and deliquescence, before mentioned. For thirty years, the preparation under the Specific Medicine label, has been the standard with Eclectic and on its qualities their literature regarding the ther-

SODIUM PHOSPHATE.

apy of Sodium Phosphate has been established. Aside from its laxative action, the specific qualities of Sodium Phosphate are tersely stated by Dr. Scudder in his first work on *Specific Medication*, as follows:

Therapeutics of Specific Medicine Sodium Phosphate.—"We employ a pure article of Phosphate of Soda, and demand that it be finely powdered.

"The Phosphate of Soda has two uses—as a restorative, and for its influence upon the intestinal tract. As a restorative, I employ it extensively with children, in those cases where there is impaired nutrition, with pallidity of tongue and mucous membranes. In these cases it will be found to exert a markedly beneficial influence. It is generally administered in milk, in doses of one to three grains, four times a day. We occasionally find a case in the adult where it will prove beneficial. These are uniformly marked by the pallid mucous membranes and inaction of the bowels. The dose varies from five to fifteen grains.

"Its second use is as a laxative for children. We find cases of constipation that will yield to no remedies; the child suffers from indigestion, and occasionally from colic. In these cases, Phosphate of Soda, in doses of from three to five grains three times a day, will give permanent relief.

"Phosphate of Soda is also an excellent laxative for the adult, especially in cases of habitual constipation, with hardened feces. In this case, twenty to thirty grains, in a large glass of water, is taken on going to bed at night."

The field of usefulness of Specific Medicine Sodium Phosphate, so well stated on the label accompanying the bottle, may be reproduced to advantage:

"Specific Medicine Sodium Phosphate is a remedy of great value in stomach and intestinal disorders where a corrective, or even a saline laxative is required. It is decidedly useful where the tongue has a whitish coating and the stools are green and white and foul-smelling. It is also useful in infantile dyspepsia, when the tongue and membranes are pale, the eructations sour, and there is occasionally colic. When the above indications are present it corrects malnutrition, associated with either irritation or inactivity of the bowels. It is a good remedy in jaundice, biliary catarrh, hepatic colic, bilious headache, and obstinate constipation, being selected according to the indications given below, viz.: Pale tongue and membranes; general malaise and inanition; anorexia with tender abdominal muscles; dirty tongue and sallow skin; tongue coated golden yellow and moist, or a dry, furred coating upon a pallid tongue; green and white diarrhea, with malnutrition; or hard, white, pasty, or spongy stools which float upon water; habitual constipation with hard, dry stools; bilious headache; jaundice.

Specific Use.—As a restorative in childhood, and as a lavative.

Dose.—Specific Medicine Sodium Phosphate, grs. v to grs. xx dissolved in a teaspoonful of water, once or twice daily."

FERRI ACETAS.

FERRI ACETAS.

Iron has been used in medicine, from an early day, both as the finely divided metal, and as some form of salt. It has a reputation that extends to every branch of the medical profession, and to every form of domestic practice. The salts and modifications of iron as used in medicine are legion, possibly outranking in number those of any other element.

Among Eclectic physicians, the favorite form for the administration of iron is an improved modification of Rademacher's Ferri Acetas, which, in its present condition, has come to be the standard. Physicians and pharmacists familiar with the past record of this substance, are aware that the original Rademacher's formula, produced a very defective pharmaceutical preparation. It was made by a double reaction between ferrous sulphate and plumbic acetate, in connection with white wine vinegar and alcohol. The resultant ferrous acetate gradually changed to a ferric acetate, the liquid changing in color from a pale straw-color, to a red. Next, an insoluble basic acetate ensued, in which more or less of the iron separated. In some cases, the entire iron content of a bottle settled to the bottom, or collected as a crust on its sides, the liquid becoming colorless. This imperfection was finally overcome in the Specific Medicine, by deviating the process, so that a double salt ensued, which remains permanently in solution. Specific Medicine Ferri Acetas, as now perfected, has a light red color, a fragrant, ethereal odor, a characteristic flavor, and remains permanent in any climate, and for any length of time, nothing, in a pharmaceutical sense, being lacking to its perfection. Physicians accustomed to the disagreeable acid salts of iron, or such uncertain preparations of iron as the commercial carbonate, will do well to remember this delightful form, that is so highly acceptable to patients, and so effective in action.

THERAPEUTICS OF SPECIFIC MEDICINE, FERRI ACETAS.

The original treatise of Dr. Scudder, concerning the therapy of iron, is too lengthy to be reproduced in full, but admits of a few abstracts of interest, as follows:

"Rademacher claimed that iron was specific to one of his three *epidemic constitutions*. This was characterized by pallor of the skin, moderate heat, with a small, thin, or soft empty pulse. His description, so far as I have seen it in translation, is so meager that we can hardly determine the condition in which he val-

FERRI ACETAS.

ued it so highly, even treating all the cases of pneumonia in a season with iron alone.

"We employ iron as a restorative. It is a component part of the red corpuscles, and experience has shown that its administration stimulates the formation of these bodies. In proportion as the red corpuscles are increased, blood-making becomes more active and nutrition is improved. It thus becomes a very important remedy in cases of anemia, with impaired nutrition.

"Recent investigation has shown that the solid *blue* coloration of tongue is an indication for small doses of iron in any disease. For this I would prescribe,

"R Ferri Acetas, ʒij.; Water or Syrup, ʒiv.; M. Sig. A teaspoonful every three or four hours."—*Specific Medication*.

The following article by Dr. Felter gives, in a condensed form, the uses of Ferri Acetas:

"Action, Medical Uses, and Dosage.—Ferri Acetas is tonic and astringent. Besides its internal administration as a chalybeate, it forms an excellent vaginal enema for *leucorrhœa* when properly diluted with water. It is one of the best of internal styptics. Following the indications given below, it will be found an admirable remedy in diseased conditions requiring an acid preparation of iron other than that containing hydrochloric acid. Thus it proves useful in *female diseases*, the prostration of *typhoid* and other *adynamic fevers*, *scurvy*, *low cachectic states*, *constitutional syphilis*, and *anemic conditions*. The dose is from 10 minims to 1 fluid drachm, given in a sufficient quantity of water, the smaller doses (1 to 10 minims) being preferred for specific effects."—*American Dispensatory*.

To the foregoing may be added the directions on the label of Specific Medicine Ferri Acetas as a summary of the therapeutic uses of this admirable remedy:

SPECIFIC USES AND DOSAGE.

Specific Medicine Ferri Acetas is an admirable iron preparation to administer when an acid solution of an iron salt is required that contains other than hydrochloric acid. The indications are a pale, transparent skin; solid bluish coloration of skin and membranes; marked blueness of the veins; dull, heavy pain in the top and back of the head. Following these indications it will serve a good purpose in anemia, the prostration following typhoid and other low fevers and exhausting discharges, female disorders, scurvy, and low cachectic conditions.

Specific Use.—Blood restorative; hemostatic. In chlorosis, and in anemic conditions with pallor of surface, muscular debility, aversion to motion, and blueness of tongue; also in malaria, cachexia, and spanomenorrhœa. Contra-indicated when gastric catarrh exists.

Dose.—Specific Medicine Ferri Acetas, ʒij; water, ʒiv. M. Sig: A teaspoonful in a little water every two, three, or four hours.

(Miscellaneous Preparations continued in Drug Treatise No. XIX).

A TREATISE

ON

Cupri Acetas, Carbo Vegetabilis, and Triturated Podophyllin

The Therapeutic Uses are from the writings of JOHN M. SCUDDER, M. D., HERBERT T. WEBSTER, M. D., JOHN KING, M. D., and HARVEY W. FELTER, M. D.

The History of the Discovery of Resin of Podophyllum is from a letter of JOHN KING, M. D., its discoverer.

The Description, Chemistry, Pharmacy, and History of each of these remedies, are by JOHN URI LLOYD, PHAR. M.

- Treatise No. I embraces Thuja Occidentalis.
- Treatise No. II embraces Cactus Grandiflorus.
- Treatise No. III embraces Pilocarpus (Jaborandi.)
- Treatise No. IV embraces Veratrum Viride.
- Treatise No. V embraces Chionanthus Virginica.
- Treatise No. VI embraces Asepsin and Asepsin Soap.
- Treatise No. VII embraces Collinsonia Canadensis.
- Treatise No. VIII embraces Nux Vomica.
- Treatise No. IX embraces Gelsemium.
- Treatise No. X embraces Belladonna.
- Treatise No. XI embraces Oenanthe Crocata, Vegetable Caustic and Crataegus.
- Treatise No. XII embraces Ergot.
- Treatise No. XIII embraces Macrotys.
- Treatise No. XIV embraces Dioscorea.
- Treatise No. XV embraces Development of the Pharmaceutical Still.
- Treatise No. XVI embraces Scutellaria [in press].
- Treatise No. XVII embraces Mangifera Indica and The National Pure Food and Drug Act.
- Treatise No. XVIII embraces Libradol.
- Treatise No. XIX embraces Sulphurous Acid, Hydrochloric Acid, Carbolic Acid, Sodium Sulphite, Sodium Phosphate and Ferri Acetas.
- Treatise No. XX embraces Cupri Acetas, Carbo Vegetabilis and Triturated Podophyllin.
- Treatise No. XXI will embrace Apis, Tela Araneæ and Cantharides.

Drug Treatise, Number XX.

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Cupri Acetas.

[SPECIFIC MEDICINE.]

Under the name Cuprum, a solution of the Acetate of Copper has been employed in Eclectic medicine from the middle of the nineteenth century. In former times, the beneficial effect, in certain afflictions, of cucumber pickles *greened* by digesting them in vinegar, in a brass kettle, led to their use in medicine, Dr. Scudder commending them as follows:

"For some years I have prescribed Copper in the pleasant form of *greened* pickles, with most marked advantage in some cases of chronic disease. Even yet, I prefer to give Copper in this form, rather than as a medicine, but this is probably owing to prejudice."

This empirical form of medication was but an expedient, and a temporary means towards an end. Greened pickles were not always to be obtained, nor is the dosage as exact as modern therapy requires.

Long before this, however, in Homeopathic medication, acetate of copper had been highly commended by Rademacher, this preparation giving the patient in reality the same copper salt obtained in the greening of pickles. It was made by the double decomposition of cupric sulphate and plumbic acetate, and after investigation in contrast with other salts and copper, was accepted by Eclectics as the foundation for their Specific Medicine Cuprum.

That copper exerts a positive influence in disease, is supported by all who are familiar with its influence. The fact that workers in copper did not suffer from cholera, in the very height of the plague, is also a matter of record. These facts, together with the provings of Homeopaths, and the clinical investigations of Eclectic physicians, led to an exactness in the therapy of those who use the Specific Medicine, that makes of *Cuprum* one of the most useful remedies, in hands qualified to administer it, when properly indicated.

In former years, copper salts were classed among the poisons, but at present they are considered with the *energetics*, that vomit in over-doses.

The pharmacy of the Specific Medicine *Coprum*, is based on the process of Rademacher, and the preparation will keep indefinitely, without change. It has a blue or blue-green color, a pleasant, ethereal, acetous odor, and a not unpleasant taste, which lingers, metallic-like, on the tongue and fauces.

CUPRI ACETAS.

Therapeutics of Specific Medicine Cuprum.—The personal observation of Dr. Scudder is recorded in *Specific Medication*, as follows:

"The cases where I have found it especially beneficial are those in which, with anemia, there is not very great loss of flesh. The surface is pallid, or sometimes tawny, the skin waxy, parts usually colored with blood pale, with sometimes a slight greenish tinge; the tongue broad, pallid, but usually clean; bowels torpid; the pulse rather full, but without sharpness of stroke.

"It makes no difference what the disease is, if these symptoms present, I would think of Copper as a remedy.

"Rademacher employed Copper in the treatment of acute disease, and claimed that there were seasons when the endemic constitution of disease demanded it. The symptoms calling for it were: 'The color of the face was mostly palish gray, dirty light blue, seldom reddish, and only a few times, in evening exacerbations, was it bright red and hot. The palate was always red. The sweats were moderate, sometimes clammy, and often smelt very sour, and patients felt worse after them. In most cases there was a tendency to diarrhea, or there was more or less of diarrhea present. In pneumonia, patients complained of a sense of pressure under the sternum and of weight in the chest, though sometimes there would be no complaint until a sense of suffocation announced extensive infiltration of the lung.'

"Copper is the blood-maker after exhaustive discharges, as uterine hemorrhage, hemorrhage from the lungs and kidneys, profuse diarrheal discharges, etc. It is also a remedy in those cases of debility simulating these just named. In Asiatic cholera and some choleraic diseases, these appearances will present with, or before, the first discharges; in these, Copper is a remedy. In some menstrual lesions we observe the same symptoms, and use Copper. I use Rademacher's tincture, gtt. x. to water $\frac{3}{4}$ iv.; a teaspoonful three or four times a day."

Dr. Webster (*Dynamical Therapeutics*), referring to the trituated acetate of Copper, thus defines its uses:

"Copper influences the cough center, and is a good remedy for some cases of whooping-cough, though I think we have a more reliable remedy in drosera, usually. In its influence on the cough center, copper somewhat resembles corallium, being adapted to spasmodic coughs, laryngismus, and spasmodic asthma. The cases of this kind that would especially indicate the remedy are those in which the convulsive tendency is so marked that the patient is liable to go off into convulsions. Such cases in children, complicated with whooping-cough, should cause one to study Copper as a probable remedy."

The American Dispensatory gives a detailed account of the chemistry and qualities of Cuprum, and to this the reader is referred in case the data given in our treatise are insufficient. Concerning the use and dose of Cuprum, the *Specific Medicine* label carries the following:

"Cuprum is the remedy in *anemia* without great loss of flesh. The specific indications are skin tawny, dirty, yellowish-greenish, pallid or waxy; parts usually red are pale or greenish; tongue broad, uncoated, and pale; gums blanched, pulse small, soft, and quicker

CARBO VEGETABALIS.

than usual; bowels torpid, with colorless discharges, and if loose the pale evacuations resemble rice water; anemic states with dirty-greenish tinge, and without great loss of flesh; chlorosis; tissues full, but soft and doughy; after hemorrhages or exhaustive discharges, as a blood maker, when the skin is pale and transparent."—*Am. Disp.*

Indications.—Pallor of skin, slighty tawny or greenish. Feeling of exhaustion, without apparent reason.

Use.—As a stimulant to blood-making and in disease of the ductless glands.

Dose.—℞. Sp. Med. Cuprum, gtt. x; water, ℥iv. M. Sig.—A teaspoonful of the dilution four times a day.

CARBO VEGETABALIS.

(Specific Medicine.)

Carbo Veg. has been theoretically criticised as a therapeutic agent because charcoal is insoluble. Its passive nature towards cold bodies is another argument against its value as a remedy. However, all recognize its absorbing and purifying powers over gases and foul emanations; also, its intense energy under certain conditions, as its explosive reaction with sulphur, even in the cold, if the mixture be struck with a hammer. Nor need we omit to state that so corrosive an acid as Oil of Vitriol is destroyed when warmed in contact with carbon. Taking these facts together, and the fact that the vital processes, both plant and animal, decompose vegetable compounds and rearrange simple bodies in a manner very different from the results of test-tube experiments, and we may become charitable towards the theory that carbon may exert therapeutic effects both misunderstood and unexplained by the physiologist or the chemist. In this direction we have also to meet the positive assertion of a great number of observing physicians, who state positively that carbon exerts a specific action, if it be given in the proper dose and form, under the specific indications calling for its administration.

It is essential that the carbon be made from clean wood, preferably willow, freed from its bark. It is also necessary that it be not exposed to the air after burning, for it rapidly absorbs gases and becomes foul. Possibly the care taken in selecting, powdering, triturating, and preserving the carbon used in making Specific Medicine *Carbo Vegetabilis* accounts for its excellent reputation. Physicians and pharmacists should be careful to cork the vial immediately after

CARBO VEGETABALIS.

Each portion is removed. From the work, "*Specific Medication*," by Dr. J. M. Scudder, we extract as follows:

Therapeutics of Specific Medicine Carbo Vegetabilis.—"Carbo is an absorbent and antiseptic, and has this general use, both internally and topically. Given in water-brash, or where there is decomposition of the food, it is sometimes beneficial. So in topical disease—with free secretion and tendency to sepsis—its local application absorbs the one and checks the other.

"The *specific* use of charcoal is to arrest hemorrhage from the bowels. It has been used in enema, ʒss. to ʒj. finely powdered, to four ounces of water, thrown into the rectum. Why this checks the hemorrhage, I can not tell; that it does, I have the evidence of my own eyes.

"For several years I have employed the trituration as a remedy in passive hemorrhage, with most marked benefit. I employ it in threatened hemorrhage during typhoid fever; in menorrhagia, especially when chronic; in prolonged menstruation, the watery discharge that sometimes follows menstruation; hemorrhage from the kidneys, hemorrhage from the lungs, and in some cases of leucythemia.

"A good indication for this remedy is a small, pallid tongue, with lenticular spots, and with this it may be given in any form of disease.

"The dose of the trituration is one grain, repeated as often as necessary.

"Carbo-Veg. is the remedy for passive hemorrhage from any part of the body, the remedy for hemorrhage in typhoid fever, and the remedy for the hemorrhagic condition in all typhoid disease. I have used it in uterine hemorrhage (not post partum), in hemorrhage from the lungs, bowels, kidneys, and nasal passages, with most satisfactory results. It is a valuable remedy in typhoid conditions, with moist tongue and tumid abdomen."

The field of usefulness and dosage, as given on the Specific Medicine label, which sums up its present place as a remedial agent, may be recorded as follows:

Carbo Vegetabilis is indicated in the following conditions:—The pale expressionless tongue, with but little coating and lenticular spots, or a light coat which easily lifts in patches; pallid skin; weak pulse; tumid, doughy abdomen, tendency to hemorrhage of passive character, epistaxis, hemoptysis, hematuria, and hemorrhage from bowels during typhoid fever; frequent foul hemorrhagic discharges from the bowels; salty taste in the mouth. All this is a picture of profound asthenia and excessive secretion. Carbo veg., is a remedy for menorrhagia, prolonged menstruation, and for the watery flow that sometimes follows menstruation.

Indications.—A pallid, expressionless tongue, small, feeble pulse, tendency to hemorrhage.

Use.—A remedy for hemorrhage and profuse secretion.

Dose.—One grain every two or three hours.

TRITURATED PODOPHYLLIN.

TRITURATED PODOPHYLLIN.

(Specific Medicine.)

History.—*Resin of Podophyllum*, the first of the class of Eclectic concentrations of the resinous group, was discovered in 1835, by Professor John King, M. D., who described the substance in the *Philosophical Journal and Transactions*, 1844, Vol. I, pp. 157-166, and named it Resin of Podophyllum. In commerce this became known as *Podophyllin*. The discovery of this substance, is a matter of interest and historical importance, and as I am in possession of authoritative data concerning the matter, I deem it necessary to record officially the facts, as follows:

DISCOVERY OF RESIN OF PODOPHYLLUM.

NORTH BEND, OHIO, June 15, 1887.

PROF. JOHN U. LLOYD.

My Dear Sir,—At your urgent request, I will endeavor to give you a brief account of the discovery of the Resin of Podophyllum Root, more commonly known as "Podophyllin." My introduction to it was entirely accidental, and attended with very unpleasant circumstances.

In the fall of 1837,* I think it was, knowing nothing of this resin, an attempt was made to prepare a hydro-alcoholic extract from some forty pounds of the coarsely-powdered Podophyllum Root. A portion of alcohol having been distilled over from the root tincture, water was added to the remaining tincture, the intention being to evaporate this diluted tincture that a hydro-alcoholic extract might be had, but night coming on, the process of evaporation was postponed until the following day. On the next morning, while stirring the cold mixture, numerous pieces of a dark, somewhat porous and rather brittle body, were found in the fluid. Many were the surmises as to what they were, and the query arose as to their value, if any, as a medicinal agent.

In the midst of these speculations, a young lady, about seventeen years of age, who was present, complained of feeling ill. Having no idea of the intense activity of the article just discovered, I administered about twelve or fifteen grains. Nothing further was thought of the matter until about an hour afterward, when my attention was called to her condition. She was in severe pain and distress, cramps in the stomach and extremities, pulse small and feeble, extremities cold, excessive vomiting and hypercatharsis, and apparently sinking rapidly. Her condition greatly resembled that of a person suffering from a fatal attack of Asiatic cholera. To say that I was greatly alarmed would but feebly describe my mental condition. I ran to secure the aid of two or three professional friends, but could find none of them in their offices. Then I ran back again, trembling over what might be the consequences, and thinking out a course of treatment to pursue. A princely fortune could not induce me to undergo a repetition of such condition.

By the time I reached the patient, I had become more calm. A half-saturated, aqueous solution of potash saleratus was given, in table-spoonful doses, every ten minutes, several doses being administered before the stomach would

* The date was earlier, because data, elsewhere recorded, show that it was as early as 1835.—L.

TRITURATED PODOPHYLLIN.

retain it; subsequently, the intervals between the doses were lengthened. Sinapisms were applied to the wrists and ankles; a fomentation of bitter herbs, as hot as could be borne, was applied over the stomach and abdomen, changing it as often as required. In about an hour the extremities became warm, and a general perspiration soon followed, with diminishing suffering and a partial return to a feeling of health and strength. In about an hour or two succeeding the improvement, the sinapisms were removed, an infusion of slippery-elm bark was ordered to be drunk freely, and about eight grains of the Compound Powder of Ipecacuanha and Opium were given every three hours. The next morning she was decidedly better.

In the course of the second day, her friends allowed her to have a little soup, which was followed by a serious gastro-enteritic inflammation. The fomentations and sinapisms were repeated, and the Diaphoretic Powders continued, as well as the slippery elm infusion, to which some prepared charcoal was added, not daring to prescribe a more active laxative. By perseverance in this course, the patient recovered in six or seven days, but, unfortunately, with some chronic gastro-enteritic abnormal condition, that remained for many years. From this experience I was so influenced, that I feared to use any of the remainder of the resin until at least eighteen months had passed, when I ventured a repetition of its use, but in much smaller quantity, and with most excellent results.

There, my dear Professor, you have in a nutshell my discovery, which led to further investigations, resulting in the obtainment of more or less active principles, from other of our medicinal plants.

In closing, permit me to add that I have found your medicinal preparations, resinoids, concentrated remedies, etc., that I have had from you since you have entered into the manufacture, to be reliable and worthy of confidence.

Yours with Respect,

JNO. KING, M. D.

The introduction into medicine of Podophyllin came during the stormy times of the Eclectic alkaloid-resinoid-concentration crusade, Podophyllin being, as has been shown, the pioneer of the list.

Concerning the Name Podophyllin.—Among those who advocated the name "Resin of Podophyllum" was Professor John King, to whom, as has been shown, belongs the honor of discovering this substance. He first gave it the name Resin of Podophyllum, which he employed in its introduction,* although he finally accepted the popular name "*Podophyllin*," making this the prominent name in the first edition of the American Eclectic Dispensatory (1852), though he supplemented it by calling the drug "a resin, to which the name of *podophyllin* has been given." From 1840 to 1855 considerable controversy, accompanied by some acridity, was exhibited in the Eclectic ranks in connection with the subject of "resinoids" and their names, as shown in the current pages of the Worcester Journal of Medicine (Worcester, Mass.), The Western Medical Reformer (Worthington, Ohio), the College Journal (Cincinnati), and the Eclectic Medical

* Western Medical Reformer, April, 1846.

TRITURATED PODOPHYLLIN.

Journal (Cincinnati). This controversy is probably long since forgotten by most persons, and entirely unknown to those unacquainted with the actors and with the early Eclectic literature connected with the subject. The late Mr. William S. Merrell, of Cincinnati, who first sold the crude, resin-like precipitate, and who first used the term *podophyllin*, ably defended that name. In reply to critics, he called attention* to the fact that the names for Jalapin, and several other like bodies which were not definite chemical compounds, were devised after that plan, and he finally informed his antagonists that he had actually accepted the name suggested (to use his words) by "Prof. Wood, the author of the United States Dispensatory, who is no mean authority." Mr. Merrell then continued his argument by saying:

"The names of the resinous principles, or resinoids, should be made to terminate in *in*, after the analogy of the generic substance *resin* or *rosin*, and accordingly we should write *Podophyllin*, *Macrotin*, *Jalapin*, etc."

This method of nomenclature was accepted by Hill (Cincinnati), and Keith (New York), the other makers of Eclectic remedies at that period, and each placed a limited line of "resinoids" upon the market. They accepted, without question, the nomenclature that Mr. Merrell had suggested, although, in Eclectic literature, some very acrimonious discussion appeared concerning the drugs to which the names were applied (Note p. 7). The foregoing view of these terms finally prevailed among Eclectics, and became firmly established in the drug trade, and, as before remarked, when the precipitate, more or less resinous, obtained from *Podophyllum peltatum*, finally demanded recognition in the United States Pharmacopœia, it came before the revisers of that work as an Eclectic drug, under a name formulated by the editors of the United States Dispensatory (a fact overlooked by some who opposed that name), and that had become argumentatively established as the universal appellation.

Introduction to the U. S. P. (*Resina Podophylli*).—The substance under consideration was, as before stated, the first member in the list of Eclectic "resinoids," alkaloids, and concentrations to attain popularity. Through the influence of Professors King, Hill, Morrow, and other contributors to Eclectic literature, the drug had quickly assumed a position and importance seldom attained within so short a period by vegetable remedies. Its unquestioned efficacy as a cholagogue cathartic established it in the practice of the Eclectic medical profession. Appearing in the heat of the celebrated controversy over the abuse of the mercurial preparations then so ex-

* *Eclectic Medical Journal*, July, 1850, p. 299.

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tensively employed in Regular practice, it was hailed by Eclectics as a vegetable substitute for the mercurials, and was called by them the "Eclectic Calomel."*

Before its character was understood by the leaders in the regular school of medicine, it became, under the name *podophyllin*, perhaps the most prominent of Eclectic drugs. Such conspicuity could not exist, however, with reference to a drug used so extensively in Eclecticism, without recurring introductions to members of the Regular school, and, in consequence, long before it was authoritatively recognized by any of their book-makers, it came into general repute with numbers of their general practitioners. Thus commercial "*Podophyllin*" became a valued drug in general Regular practice, years before it received recognition either in the United States Pharmacopœia or Dispensatory. Hence, it was that when at last it was deemed advisable to give a position in the Pharmacopœia to this drug which had long been known to be of unquestioned value, it was found that Mr. Merrell's name, *Podophyllin*, had become established at home and abroad.

Probably from ignorance of its record in Eclecticism, at least without recognition of that fact, the controversy over the name was resuscitated and continued, when the drug knocked at the door of the U. S. P. As early, however, as 1851,† the late Edward Parrish had recognized the advent of these products of Eclectic Pharmacy, (Resinoids or Concentrations), and deprecated their names. He said,

"As well might the Calisaya Extract of Ellis be called *quinia*, as the impure resinoid substance precipitated from a tincture of May-apple, by the above process, *podophyllin*."

This argument, however, failed to impress either the makers or the consumers of "*podophyllin*," and when the preparation became official in the United States Pharmacopœia (1860) as "*Resina Podophylli*," the title of the commercial drug remained unchanged. This fact was commented upon by Dr. Squibb in 1868, who considered it "unfortunate that those whose aim should be to give accuracy and precision to matters connected with medical science and art, should so commonly refuse to this substance its proper and correct name, and adhere to the inaccurate and otherwise objectionable name of "*Podophyllin*." He severely criticised the names affixed to the class

* These discussions, being confined to Eclectic publications, are unknown to most persons, for few students have that literature at hand.

† On the preparation of

Podophyllin, see *Am. Jour. Pharm.*, 1868, p. 1.

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(the *Resinoids* or *Concentrations*), of which Podophyllin was a member, stating that the termination *in* was

"applied to this and other substances by the Eclectics, through ignorance of its true nature. It is a resin proper,"

he continued,

"and there seems no good reason for miscalling it by an incorrect name which has attained an equivocal popularity, and the common pronunciation of which is so vulgar and inelegant."^{*}

Notwithstanding this stinging criticism, supported indirectly by the writings of other talented and enthusiastic leaders in Regular medicine and in pharmacy who confined themselves to the official appellation and threw their influence in the direction of the name that was accepted without question as being the only scientific and proper one, little impression seems to have been made on either those who manufactured or who consumed the drug. The United States Pharmacopœia, in each subsequent revision, has made the name "*Resina Podophylli*" (first given to it by Professor King), official; the influence of the majority of instructors has been continuously added thereto. But in commerce, when the drug is specified, and usually when it is prescribed by physicians, the appellation is *Podophyllin*.

Thus it was that the introduction of Podophyllin into the United States Pharmacopœia came long after the period of its discovery by King, and after it had, for several decades, been employed in Eclectic medicine.

With the enlarged demand for the substance, the drug became terribly sophisticated and adulterated, through the indifference of some manufacturers, the ignorance of others, and the commercial instincts of yet others, fostered by the demands of some physicians and pharmacists for cheapness, instead of quality. It was found that alum water increased the yield and brightened the color. It was also found that powdered *gamboge* could be mixed with the drug, cheapening it to meet these demands for cheap medicines. Consequently, the commercial label under the name *Podophyllin*, covered a number of substances sold at prices to suit the purchaser. It seems strange that a drug used in such small doses should be thus cheapened, but the history of this one remedy stands as proof that to the cheap medicine man, nothing is too cheap to withstand further cheapening.

^{*} It has since been shown that Podophyllin is not a resin, nor yet a simple substance. It carries more than one body, and is partly soluble in water, which is not the case with a true resin.

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Eclectic physicians, as a rule, know too well the folly of trusting these sophisticated products, and insist on getting the true, dark-colored Resin of Podophyllum.

The destructive chemist next turned his attention towards dissociating this resinous substance. By various methods, several decomposition products were announced, such as *Podophyllotoxin*, *Picropodophyllic Acid*, *Picropodophyllin*, *Podophyllotoxin*, etc. These are all more or less energetic, but all are faulty, none being as reliable as the natural, resinous precipitate. All attempts to force these artificial products on physicians have failed, for the very good reason that none of them equal the original drug.

The early uses of Podophyllin, in accordance with prevailing methods, was in energetic, even poisonous doses, from ignorance of its energy. The first dose given by Dr. King was enormous, and was followed by most distressing consequences to the patient concerned.

Following this unhappy experience came the usual method of prescribing the cathartic dose, which action borders on the poisonous effect of the drug. Then, with the introduction of the *specific action of drugs for their medicinal, not poisonous effect*, came the plea of Dr. Scudder for the *direct*, or *specific*, action, instead of the violent results that came from large doses. His views (1870) were expressed as follows:

THERAPEUTICS OF SPECIFIC MEDICINE TRITURATED PODOPHYLLIN.

"To obtain the direct action of Podophyllin, we prepare it for use by thorough trituration with sugar of milk, or white sugar. I prefer the trituration, one part of Podophyllin to one hundred of sugar.

"The specific use of Podophyllin, in this form, is to arrest increased mucous secretion from the small intestine, and give it power to perform its function. It will cure acute or chronic diarrhea with mucous discharges, and, in some cases of cholera infantum, it 'acts like a charm.' No one who has used the trituration of Podophyllin in these cases would be willing to dispense with it, and many will find it of advantage in other cases.

"This remedy has been employed in doses much too large, and physicians are fast learning that, in this case as well as some others, small doses are very much better than large ones."—*Specific Medication*.

The most complete treatise on the therapy of Podophyllin is that of H. W. Felter, M. D., in the *American Dispensatory*, which, on

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account of its great merit and comprehensive statements, we introduce, verbatim, as follows:

Action, Medical Uses, and Dosage.—"Podophyllin possesses the cathartic properties of the crude drug, in an exalted degree. While it is slow in action, it is certain in its results. Some persons are so susceptible to the action of the drug, that a dose or one-half grain will actively purge them. The ordinary cathartic dose of this resin generally requires from four to eight hours to act, but this action is quite persistent, often producing copious alvine discharges for one or two days, and when over, leaving the intestines in a normal condition, seldom being followed by the after-constipation so common from the use of ordinary purgatives. As with the crude drug, the cathartic action of Podophyllin is increased by common salt. From four to eight grains operate as an active emeto-cathartic, with griping, nausea, prostration, and watery stools; from two to four grains, as a drastic cathartic, with nausea and griping; from one-half to two grains generally operates as an active cathartic, leaving the bowels in a soluble condition; in very small doses, it is gently aperient and alterative. In doses of one-half or one grain, it is one of our most valuable cholagogue cathartics, operating mildly, yet effectually, arousing the whole biliary and digestive apparatus to a normal action, and very persistent in its character. 'The action of this resin in affections of the liver has been doubted or denied by some practitioners, but, as we think, on erroneous grounds; judging from the beneficial results following its use in these affections, whether those results be due to direct influence upon the liver or to an indirect one. Certainly, its effects in this class of diseases, are superior to those of the so-called cholagogue mercurials.' (JOHN KING.)

"It likewise exerts a favorable influence on the cutaneous functions, producing and maintaining a constant moisture on the skin. In doses of from one-eighth grain to one-half grain, or rather in sufficient doses not to purge, it acts as a powerful alterative, and will induce ptialism in some persons. This drug should not be given in bulk, but should be combined with ginger, hyoscyamus, leptandra, or resin of caulophyllum, or some form of alkali, which renders it less liable to nauseate or gripe. Should catharsis be too severe, an alkaline solution, with aromatics, by mouth or enema, will check it.

"A popular and good method of preparation is that of triturating it with milk sugar. This not only obviates, to a certain extent, its irritant action, but singularly increases its purgative qualities. During its administration, all articles of food, difficult of digestion, should be avoided. According to Professor Locke, Podophyllin, prepared by alum water, is apt to gripe. Eclectics long made use of this agent in those cases where mercurials were used by other practitioners, and found the result vastly in favor of Resin of Podophyllum. It appeared to fulfill all the indications for which mercurials were recommended and used.

"It is not, however, for its cathartic use that Podophyllin is mostly valued by the Eclectic profession, but rather for its specific effect, when given in small doses. Properly administered, it is a stimulant to the sympathetic, nervous system, acting principally upon the parts supplied by the solar plexus. It improves digestion and blood making, and stimulates normal excretion. For its action upon the liver, repeated small doses of the trituration (1 to 100), or a daily pill of podophyllin (one-twentieth) grain and hydrastin (one-fourth grain), is much to be preferred to its cathartic dose. It should be given in the same manner when its action on the pancreas and spleen is desired.

"Few physicians appreciate the action of this drug, in so

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and *intestinal disorders*. It exerts a peculiarly specific action on all forms of stomach and bowel trouble with atony, characterized by full and relaxed tissues, with mucous discharge. The case is never one of loss of function from irritability, but from atony. In the *summer disorders of children*, especially *cholera infantum*, it is often indicated, and is quick to restore normal action when the bowels are loose, with passages of mucoid, slimy material. The movements of the child are sluggish, the tongue is coated a dirty yellowish-white, the superficial veins are full, and the countenance is dull and expressionless. In many cases of chronic disease, associated with feeble digestive power, which is but little improved by the ordinary stomach tonic, this remedy renders excellent service. The trouble is usually atony of the upper part of the small intestines, and the stimulant dose of triturated Podophyllin overcomes the difficulty. Podophyllin is a favorite anti-constipation remedy.

"It is equally valuable in *costiveness* of the young child, and in the aged. In very young babes this trouble will yield to: $\mathcal{R}$ Podophyllin, second decimal trituration, grs. xxx; Brown Sugar, $\mathfrak{z}$ ii; Aqua, $\mathfrak{z}$ iv. Mix. Sig. Teaspoonful, four times a day.

"For adults, the daily use of from one to two of the Podophyllin and Hydrastin pills (one-twentieth and one-fourth grain) will generally be sufficient to overcome the trouble. The cathartic dose should never be employed for the relief of costiveness, or when a cholagogue action is required. When the stools are hard, and grayish-white or clay-colored, and float upon water, the remedy is peculiarly effective, as it is also in dry stools, with tympanitic abdomen and wandering, colicky pains. *Flatulent colic* of children, when associated with constipation, will readily yield to small doses of this drug, while, as a remedy for *dysentery* and both *acute and chronic diarrhea*, accompanied by portal sluggishness and hepatic torpor, few remedies excel it. *Dyspepsia*, with atony and thickened mucous membranes secreting abundantly, calls for stimulant doses of Podophyllin. The head feels full, the tissues and veins appear full and doughy, the skin is sodden, and a dirty coating covers the tongue from tip to base.

" $\mathcal{R}$ Podophyllin, $\frac{1}{20}$ grain three times a day.

"*Cardialgia*, accompanied by constipation, yields to the trituration (1 to 100). This drug has been justly valued in *hepatic disorders*. In that state, ordinarily known as "*biliousness*," this drug, or Specific Medicine Iris, can usually be depended upon. Indeed, they act very nicely in combination. There is dizziness, a bitter taste, the stools show an absence of bile, and greenish, bitter material is vomited. The remedy is often indicated in both *acute and chronic hepatitis*, though usually contra-indicated in inflammations of the gastro-intestinal tract. Fullness in the region of the liver, with aching under the scapulae and in the back of the neck, with dizziness, usually calls for this drug. In *icteric states*, with clay-colored stools, it may be alternated with Chionanthus.

"The unpleasantness attendant upon the retention or passage of *biliary calculi* is frequently relieved by this agent. There is great pain in the region of the gall bladder, coursing to the left and downward. Sometimes there is constipation; as often, diarrhea. There is a bad taste, and the patient is often jaundiced. $\mathcal{R}$ Podophyllin, gr. ij. at night, followed in the morning with a large quantity of olive oil. In *hemorrhoids*, dependent on biliary insufficiency with portal inactivity, it may be given in alternation with sulphur, the Podophyllin being particularly desired when there is constipation with tenesmus. The small dose alone is required, from one-twentieth grain to one-tenth grain, three or four times a day.

TRITURATED PODOPHYLLIN.

"Podophyllin may do good service in those forms of *cough*, characterized by *bronchorrhea*, especially if it be associated with *gastric catarrh*. Here, minute doses of sulphur are also valuable. In *heart disease*, when aggravated by hepatic inactivity and portal torpor, the cardiac remedy is rendered more efficient if associated with minute doses of this drug. It has long been recognized as a remedy for rheumatism, when the patient is sallow and inactive, presents fullness of tissue, and complains of dull pain and heaviness in the right hypochondrium. In *renal disorders*, when the general specific indications for its use are present, it will restore the secretory power of the kidneys. Podophyllin has long enjoyed the reputation of exerting a powerful action upon the whole glandular system. For a long time it was, and is still with many, a favorite remedy in *syphilitic manifestations*. For persistent *pustular conditions*, *eczema*, and *cracked or fissured skin*, Ellingwood declares it a good remedy. It acts powerfully as an alterative—one of the best in the whole domain of medicine—at the same time aiding and improving the digestive process.

"Podophyllin is a remedy for *pain*, according to Professor Scudder—the deep-seated pain in the ischiatic notches. It has served a good purpose in inflammations (when not of the digestive tract), accompanied with great constipation. Here the cathartic action is required, as it is also in the forming stage of *febrile diseases*, with the exception of typhoid fever. Still, if indicative fullness be present, the small dose will assist very materially in overcoming these disorders.

"In *malarial troubles*, small doses of Podophyllin should be alternated, given with Cinchona. For all of the preceding uses, Specific Medicine Podophyllin may also be used, but the dose must be correspondingly large. For the gastric disorders, many prefer the Specific Medicine to the resin. Cathartic doses are required in *biliary calculi*, *apoplexy*, *dropsy*, and in some forms of *inflammation*. Younkin advises cathartic doses (one-sixth grain every two hours, with ten grains of Potassium Bitartrate) for the relief of *gonorrhoea epididymitis*."

"When the cathartic action is desired, the pure resin can be employed, triturated with some powder, or made into soft pills. When the alterative or specific small-dose effect is intended, the triturate, known as Specific Medicine Podophyllin Triturated, should be used."

The dose of Podophyllin, as a cathartic, is from one half grain to two grains; as an alterative and stimulant, $\frac{1}{16}$ grain to $\frac{1}{8}$ grain; as a cholagogue, $\frac{1}{8}$ grain to $\frac{1}{4}$ grain. But the pure resin is too concentrated and too violent for safe usage. It should be both triturated with some inert diluent, and reduced in proportion. This is best accomplished by trituration with milk sugar, in the proportion of 1 to 100. The use is shown by the label of Specific Medicine Podophyllin Triturated, as follows:

Specific Uses.—Specific Medicine Triturated Podophyllin is one of the best alteratives in the materia medica, acting powerfully upon the glandular and mucous membranes. Podophyllin is indicated by fullness of tissues and veins, with an expressionless, sodden countenance, dizziness, dirty yellowish-white tongue, heavy headache, general apathy, intestinal atony, with sense of fullness and weight,

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and full, open pulse; and the lack of biliary secretion, with pale, clay-colored stools, which float upon water. It is also indicated by constipation, with hard, dry stools, accompanied with colicky pains and distended abdomen, and pain deep in the ischiatic notches. Following these indications, it proves a very valuable remedy. It should never be given when the features are pinched, the pulse wiry and small, or when the pulse stroke is sharp.

A good liquid form, for use in most disorders requiring the small dose, is the following:

R Podophyllin Trit. (1 in 100), grs. v. to xxx. Aqua, ℥iv. Dose, ^{one} teaspoonful every one to three hours.

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A TREATISE
ON
Apis (The Bee), Tela Araneæ
(Cobweb), Spongia and
Cantharis.

By JOHN URI LLOYD, Phar. M.

Drug Treatise No. XXI has been delayed many months, owing to the research necessary to the systematic presentation of the subjects embraced therein. This will be apparent to every studious recipient, and yet the bibliographical references presented but poorly indicate the researches necessarily made among volumes of past literature, unnamed in these pages.

Historical data, as well as therapeutical references, are cited in each instance, and the author asks that full credit be given to one and all.

The Librarian of the Lloyd Library, Captain WILLIAM HOLDEN, has been of incalculable assistance, and to him our especial thanks are due.

To the care of the author's secretary, Miss MARGARET STEWART, A. M., as well as to her translations, pages 21 and 39, is due the completeness of each subject.

The author hopes that this study of a few remedies now little known, and their past records, which are even less familiar, will be of some interest and service to both physician and pharmacist recipients.

Drug Treatise No. XXI.

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CONCERNING INSECTS AND RELATED REMEDIES IN MEDICINE.

Such remedies as are of animal or insect origin have been used from the earliest date, in medicine. As indicated in the following pages, which concern only a few of these, the record of their employment and introduction reaches, in all directions, back into antiquity. The references in Mouffet's History of Insects (1658) are particularly interesting, in that nearly every authority named in that remarkable citation of authorities of the olden time, were referred to as enthusiastic believers in insect remedies.

In Homeopathic medication many remedies of this description are however employed, being now favorites. In Eclectic therapy but four are given authoritative recognition, these four being the subject of the present treatise.

There is, however, no reason why such substances as the toxins of insects and reptiles possessed of energetic physiological reactions should not have therapeutic qualities, if remedies like beef gall, musk, and castor (likewise heirlooms of the past), are given pharmacopeial recognition. In Eclectic medicine, however, *spongia*, *apis*, *tela araneæ*, and *cantharides* are the only ones having any conspicuity. All of these, excepting the last, are highly valued by a great number of Eclectic physicians, and are being increasingly employed by physicians of other schools.

The history, descriptions, and therapeutic record of these four remedies, of which one only, *spongia*, is not of insect origin, are considered in more or less detail in the following pages. The following, from the pen of Mr. John Thomas Lloyd, briefly but yet comprehensively introduces the subject:

Insects have been used in Chinese medicine from time immemorial.* The Greeks and the Romans employed insects as far back as the time of Christ, perhaps much earlier. But it was not until the Middle Ages that they came into universal use, being then presumed to cure almost every ill that affects mankind. Since that time, most insects have fallen into disrepute as remedial agents. The number of spiders employed has gradually diminished until, at the present time, barely a half dozen species are utilized. "Home practice," however, of the older generation still recommends some almost forgotten insect remedy, as for example *Lumbricus*, angle worm oil, to cure rheumatism.

A list of the insects used in medicine during the seventeenth century would enumerate almost every insect then known to man. At that period, religionists believed that every creature was made to be of some special benefit to man. In order to apply this theory to the hordes of insects, presumably created only to serve human interests, they were identified, wherever possible, as remedies for disease. A few, however, received little or no attention in medicine, their usefulness to man being accounted for in some other way. Thus *apis*, the bee (of importance in medicine at the present day), was much overlooked, evidently because its service to man in the making of honey was deemed reason sufficient for its creation. In the case of one insect, Mouffett (1658) states that he has found in it no medicinal properties, but he expresses a strong conviction that at some time the purpose of its creation will be discovered.—J. T. Lloyd, Cornell University.

*From the admirable paper of Professor Albert Schneider, of California, titled, *Some Objectionable and Unusual Chinese Drugs Imported into the United States*, we reproduce the names only of insect and connected remedies. The uses accompanying these are to be found in the above paper, contributed to the *Pacific Pharmacist*, July, 1910.

Beetles, Carrion Beetles, Dragon Fly, Cantharides, Centipedes, Cocoons, Crickets, Earth worms, Eggs of Silk-Worms, Black Flies, Red Flies, Parasitized Insect Larvæ, Insect Skins, Dried Leeches, Maggots, Scorpions, Silk-worm Pupa, Spiders, Wasps' Nests.

Apis. (The Bee.)

(FORMERLY SPELLED APES).

History and Uses of Bees.—Bees have been used in medicine from the day of Galen. Pliny and other writers of the olden time disported at some length on the therapeutic use of the bee in substance and in compounds. Mouffet, 1658, in whose day insects and such were favorites in medicine, makes reference, as follows, to former authorities, and to the field of therapeutic usefulness the bee was then presumed to occupy.

The Use of Bees in Medicine.—First of all, their bodies as soon as they are taken out of the hive, and pounded and drank with some diuretic, or wine and milk, do strongly cure the dropsie, dissolve the stone or gravel, open all the passages of the urine, cure the stopping of the bladder. Bees that die in the honey cure impostumes, and help the dullness of sight or hearing. Also, being pounded together they cure the griping or wringing of the belly or guts, being applied to them. If poisoned honey be drank, they themselves being drank down after it, do expell it; they soften hard ulcers in the lips; being bound to a carbuncle or running sore, they heal it; they cure the bloody flux. Honey being strained with them helps the crudities of the stomach, or specks or red pimples in the face, as you may see in Hollerius, Alexander Bened, and especially in Pliny. Take bees dead in the combs, and when they are thoroughly dry make them into powder, as Galen in Euporist writes, mingle them with the honey in which they died, and anoint the parts of the head that are bald and thin haired, and you shall see them grow again. Pliny in like manner teaches to burn a great company of bees together and mingle the ashes with oil, and anoint the part, only with this caution, that the adjacent parts be not touched therewith; yea, honey scraped off bees that are dead, he affirms to be very sovereign in all diseases, and very useful. Erotis in his 61 chap. de Morh. mulieb., tells us that their ashes beaten with oil is good to make the hair white.—*Mouffet, Theater of Insects, 1658, p. 906.*

From this date, until revived in Homeopathy, Apis became gradually less important until (as shown later) Dr. John M. Scudder (1874) revived interest in it as a specific remedy in his teachings. The history of its record (after Mouffet) may be condensed, as follows:

In the chapter on *Insects in Medicinal Use, The New London Dispensatory*, Salmon, 1682, devotes two pages to Apis, together with its products, Honey and Wax, writing as follows about the insect:

The Bee. 1. **The Whole Bee in Powder**, given inwardly, provoke Urine, opens all stoppages of the Reins, and break the stone; they are good against Cancers, Schirrous Tumors, the King's Evil, Dropsie, dimness of

APIS.

sight, for being taken a good while, they waste the Humour, and restore health. So their ashes, both made into an Oyntment with Oyl of Roses and Rats' dung, cause hair to grow speedily in bald places.

Dale, 1739, restricts Apis to alopecia and as a diuretic.

Bees, dried and powdered, as an ointment in alopecia, restore the hair. Taken internally, they increase the flow of urine.—*Dale's Pharmacologia*, 1739.

Quincy, in his *Compleat English Dispensatory*, London, 1749, confines himself as follows to "*prepared bees*," ascribing no therapeutic qualities thereto.

Apes Præparatæ—Prepared Bees.—"Put the Bees into a convenient Vessel, and dry them by a very slow Fire."

Lewis' *Materia Medica*, 1768, gives Apis scant attention, but in one particular, anticipates, roughly, its most important present use. He also refers to the calcined bee:

Apes Pharm. Edinb.—Bees. This insect, dried and powdered, has been given internally as a diuretic, and applied externally (ground with honey or other like substances) for promoting the growth of hair. Some have slightly calcined the bee, in a closed vessel, to blackness, and esteemed it, when thus prepared, to be a medicine, in some cases, of more virtue; a saline matter being now in good matter generated by the fire though not as yet extricated from the other principles.—For my own part, I have had no experience of the bee itself prepared or unprepared, nor is it used in practice; the valuable products, which this insect affords, honey and wax, will be treated of in their places."

Motherby, 1775, gives even less care to Apis, passing the entire subject as follows:

If they are dried and powdered they are somewhat diuretic; but their chief use is for the preparing of honey and wax.—*Motherby's Medical Dictionary*, London, 1775.

In the foregoing articles Apis is seen to have become decreasingly important as time passed, until at the beginning of the nineteenth century the bee had practically dropped from sight as a remedy. Neglected was it by Coxe's *American Dispensatory*, 1831, as well as by the first editions of the *United States Dispensatory*, 1833, and the *Eclectic (King and Newton) Dispensatory*, 1852. The early works on American medicine that we have consulted, omit the bee as a remedy, the early Eclectic authors, such as Jones, Newton, etc., do not mention it. Even the work of the man to whom is due its resuscitation, and to whom is due the present conspicuity of Apis, Dr. John M. Scudder, with whom it was an increasing favorite, gives to Apis no place in his work, *The American Eclectic Materia Medica* (Jones and Scudder), 1866. In 1874, Dr. Scudder, in *Specific Medication*, commends Apis as follows:

The honey bee possesses marked medicinal properties, but from a prejudice against such remedies, has been but little employed.

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I have seen a number of cases of diseases in women characterized by sensations of heat, burning pains in the bladder and course of the urethra, with frequent desire to micturate. These have been promptly relieved by the use of tincture Apis, and in two cases of chronic disease of long standing, a permanent cure was effected, following the relief of these unpleasant symptoms.—*Specific Diagnosis and Medication*, 11th ed., p. 83.

Apis now became increasingly a favorite, and has since been used by thousands of physicians who consider it invaluable in the treatment of disease when it is properly indicated. One of the most comprehensive articles on the subject, titled "A Study of Apis," from the pen of Dr. Franklin Pierre Davis, appeared in the Medical Summary, 1908, from which we extract as follows:

By Franklin Pierre Davis, M. D.:

"At the present time the tincture of the honey bee is one of the leading remedies of both the Homœopathic and Eclectic schools of practice. Wolf, writing on this remedy in 1858, said that, after aconite, apis is the most comprehensive and universal useful remedy that we possess.

"After these centuries of use, the composition of the poison of the bee remains unsolved. And while to-day we do not know just what the active principle may be, yet from my experience with the remedy, I am willing to confirm Wolf's statement; for if there is any remedy that will give prompt and expected results when properly exhibited according to its specific indications, it is apis.

"**Construction of the Sting.**—A study of the mechanical construction and operation of the sting of the bee is interesting, not only in showing the manner in which the bee is enabled to force the poison into the object stung, but it gives us a clew to the proper mode of extracting the sting. By close examination of a sting that has been torn from a bee, we find a bundle of muscles near by and partly enveloping the poison bag. For some time after the sting has been detached from the body of the bee, these muscles will work with a pump-like motion, working the sting further into the wound. After the sting has been removed from the flesh, if it should stick to the clothing in such a way as to again come in contact with the flesh, it will commence working again, pulling itself into the flesh and emptying the poison into the wound, the same as if the living bee was working it.

"**Composition of the Poison.**—The elements that enter into the composition of the poison of the honey bee are unknown. It is probably a vegetable poison secreted from the honey and pollen that constitutes their food, as it is well known that the poison is much more pungent when the bees are working in the fields and accumulating stores largely than it is when they are at rest in the winter months. It is generally during the basswood bloom that we get those severe stings which draw blood and show a large white spot around the wound. It is also said that the poison of the black bee is more toxic than that of the other varieties.

"All authorities that I have found have been unable to give any light on the composition of the poison other than to say that it is generally considered that formic acid is the principal element. It is, however, difficult to find actual authority for even the presence of formic acid. Selzer has shown that the venom is not due to formic acid alone.

"From experiments made by Phisalix on sparrows, it has been proven that there are three distinct kinds of effects from the poison; a local inflammation, convulsions, and somnolence or stupefaction. In these experiments the poison apparatus was taken from the bees and mixed with water,

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this solution being injected into the birds. In all cases the results were the same as when stung by the bees. These birds are very susceptible, showing the effects almost immediately after receiving two or three stings, and die in a short time.

"Phisalix claimed that there were three distinct active principles in the poison:—

"1st. An inflammatory principle. This he finds by experiment is destroyed by heating to 100 degrees C.; the poison exposed for fifteen minutes to the heat of boiling water no longer causes the local symptoms.

"2. A convulsive principle. This is similarly shown to be destroyed by a continued heating at 100 degrees C.

"3. A stupefying principle. This was destroyed by a heat of 150 degrees C.

"Apis has a direct action on the heart, usually described as a pressure, and heaviness, accompanied by a drawing-down pain; respiration becomes heavy, followed by nausea, pain in the head, and fainting. Paralysis was the first symptom noted in the experiments on sparrows. When the injection was made in the foot, the member became inactive. This was followed by convulsions; the convulsive action continued for from two to five hours, and was followed by somnolence, stupor, and troubled respiration, which were the last symptoms noted before death. In a case where a man received about one hundred stings from black bees in a few minutes, principally on the face, hands, and arms, the following conditions were noted: In fifteen minutes he had violent palpitation of the heart, and buzzing in the ears. This was followed in half an hour by a tingling sensation in his limbs, as if he were going to sleep, while, as he expressed it, his heart beat so fast that his ears felt as if the drums would burst. A little later everything seemed to get black at once. He felt faint, and his friends thought he was dying. His lips and finger tips (under the nails) became purple. An hour later his heart slowed down, and a severe chill followed. That night he felt a peculiar sensation all through his body, which appeared in different places, but more especially in his head, back, down his spine, in the limbs, and then back to the head again. There was some pain in the region of the heart for two weeks afterward.

"**Therapy.**—Apis has proven useful in chronic ovarian pains, and relieves the stinging, burning sensation in mammary cancer. In dropsy or enlargement of cellular tissue with fever, it is of value. In malignant scarlatina, where the tissues are of a purplish color, it is indicated. In urticaria, where coldness, vomiting, and diarrhoea are present, it is our most valuable remedy; while in diphtheria and erysipelas it is always indicated. It will promptly relieve edema of the throat and nasal passages, and retention and suppression of urine in children. In those cases of irritable bladder, with tenesmus and frequent but scant micturition, with soreness and burning, it may be depended upon."

The specific use of Apis, as recorded by recent authorities on the clinical use of the drug may be expressed by the following reproductions:*

By John M. Scudder, M. D.

"Indications for Apis are frequently found in diseases of the skin, and also in diseases of the bladder and urethra. Women are sometimes afflicted with sensations of heat and burning pains in the bladder and urethra, accompanied by an almost constant desire to urinate. In this unpleasant

* These extracts are often but fragments of detailed articles. The works mentioned should be on the shelves of every physician.

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condition apis is a most efficient remedy; in fact, in any case where there is itching of the genitals, with heat and burning pain in the urethra, accompanied by a frequent desire to urinate, it is a most useful remedial agent.

"In amenorrhea, menorrhagia, and leucorrhea, with acute congestion of the ovaries, apis is a potent remedy, and it also constitutes a useful medicament in vesicular erysipelas.

"In urticaria, or 'hives,' when there is the usual itching or soreness, this drug can be employed with confidence, that it will exert a decidedly curative influence. In the treatment of diseases exhibiting a tendency to dropsy and in rheumatism where is a blanched puffiness and severe stinging pain, Apis renders excellent service. It is also of decided value in edematous conditions of the throat.

"In suppression or retention of urine (unless there is a stricture) Apis has no superior in our materia medica. When continued for some time it increases the secretion of urine, and it is, therefore, a medicament to be considered in the dropsy attendant upon structural diseases of the heart. While it can not be expected to cure such wrongs, it will afford a relief which will be highly appreciated.

"The tincture of the honey bee is an excellent remedy if the diagnosis is well made. Given the peculiar burning pain that one associates with the sting of the bee, and I should think of this remedy. Burning pain with itching in the urethra, in the bladder, or any part of the surface is met by apis."—*Scudder*.

By Finley Ellingwood, M. D.:

Specific Symptomatology.—Acute swelling-edema of the cellular tissues, local or general swelling, with the formation of vesicles; urinary irritation from atony; incontinence from feebleness; retention from irritation with dark, heavy, scanty urine.

Therapy.—The agent is prescribed in *dropsy*, which appears suddenly. Old standing dropsies are not readily influenced by it. *Edema glottidis* is subject to its influence, and it quickly relieves the edema of the throat and nasal passages which accompany *diphtheria* and *scarlet fever*. It is also curative in the dropsy which follows these two closely related diseases, from sudden suppression of urine. It influences the kidneys at the same time, causing an increase of the urine; it soothes the irritability of these organs and relieves the congestion present. When effusion from *pleuritis*, *peritonitis*, or other acute serous inflammation is present it is given with confidence.

In *retention* and *suppression of urine* in children, and the aged, from atonicity or general feebleness, it is a useful agent.

It is also useful in *irritable bladder* with teasing tenesmus, where the urine is scanty and high colored, when micturition is frequent and accompanied by much soreness and burning.

In the *urinary incontinence* of the aged and feeble it is prompt in its action.

In doses of two drops of the specific medicine apis four or five times daily, many cases of passive *hematuria* intractable to other remedies, will yield promptly.—*Ellingwood's Materia Medica, Therapeutics and Pharmacognosy*.

By Lyman Watkins, M. D.:

"The indications for apis—edema with itching, burning, and smarting of the parts. While apis is now frequently prescribed by the writer, it was not so in former years. Having somehow become imbued with the idea that the remedy was worthless, suggestions from those who recommended it were received with a feeling of indulgent incredulity, and thus stubborn skepticism deprived me of a valuable weapon against disease. Within recent years apis has been given in edema, when accompanied with itching, burning, and smarting, and has relieved the condition wherever situated.

"Edema is only a symptom, the causes being varied. It may result from cardiac, renal or hepatic affections, thrombosis, embolism, chlorosis,

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or anemia. Judgment and reason must be exercised in the treatment of disease, and we should not expect to cure dropsy when caused by incurable lesions. Yet some cases have been cured by apis and iron, in which there was evident heart complications, as shown by cardiac irregularity, palpitation, dyspnea, anemia, and great general distress, with tissues soft, pitting deeply upon pressure.

"Apis will relieve edema when there is smarting, burning, and itching in the parts. It will relieve the smarting, burning, and itching in chronic leg ulcers, if the parts are edematous. Conjunctivitis with burning, smarting, and itching in the eyelids and surrounding tissues, if accompanied by edema, will be relieved by apis. Apis will relieve like conditions in erysipelas. It will relieve these symptoms in the urethra when accompanied by edema in any part of the body. It is not so effective in gonorrheal smarting, nor in cystic irritation, nor in irritation from acrid leucorrheal discharges, but it will sometimes afford relief.

"This remedy is recommended by many writers for various conditions, and has been used at intervals for almost a century. I have never found it of any special value in any condition, unless there was edema with burning, smarting, and itching. With these indications, no matter what the disease, it has been found effective."—*Watkins' Compendium of the Practice of Medicine*.

By John W. Fyfe, M. D.:

"Apis is a very efficient remedy in retention of urine, and in some cases of irritation of the urethra; also for inflammation of subcutaneous structures, with tensive and lancinating pains, and in irritation of the skin.

"I have seen a number of cases of disease in women, characterized by sensations of heat and burning pains in the bladder and course of the urethra, with frequent desire to micturate. These have been promptly relieved by the use of specific apis, and in two cases of chronic disease of long standing a permanent cure was effected, following the relief of these unpleasant symptoms. A peculiar, burning pain, that one associates with the sting of the bee, is the indication.

"Apis is particularly useful in post-scarlatinal dropsy, when there is a blanched puffiness of the skin and the peculiar burning or stinging of the surface. We have no better remedy for simple uncomplicated urticaria, with intense itching and soreness, than specific apis in fractional doses. The direct indication for apis is constant desire, but inability to urinate freely, the urine being deep red."—*Fyfe's Specific Diagnosis and Specific Medication*.

By A. F. Stephens, M. D.:

"**Apis, Specific Indications.**—Itching, with burning of any part; hot, dry, burning, and itching surfaces, suppression and retention of urine; constant desire to urinate, with inability to do so; irritation of the urethra, with burning, stinging pain. Indications for apis are frequently seen in diseases of the bladder and urethra. Women are sometimes afflicted with sensations of heat and burning pains in the bladder and urethra, accompanied by an almost constant desire to pass the urine. In this unpleasant condition apis is a most efficient remedy. In amenorrhea, menorrhagia, and leucorrhea, with acute congestion of the ovaries, it is a good remedy.

"**Dose.**—5 to 20 minims of the Specific Medicine are added to four ounces of water, and a teaspoonful administered every one or two hours."—*Stephens' The Essentials of Medical Gynecology*.

By H. T. Webster, M. D.:

Apis.—The poison of the honey bee possesses valuable therapeutic properties, and some of these are directed to the urinary tract. In irrita-

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tion of the bladder and urethra with constant, teasing tenesmus, it is a very positive remedy, giving speedy relief in many cases.

It is also valuable when there is suppression or retention of urine, its action extending to the kidneys and relieving irritation there. Its action on the kidneys has been made avail of in dropsical conditions depending on disturbance of normal renal action. In most scarlatinal dropsy, due to renal engorgement, it may be especially commended. In such cases, however, the dose must be material, and an infusion, or full doses of the tincture, must be employed.

In vesical irritation, minute doses act best, and the 3x dilution will be found preferable to the crude drug. Of this, half a drachm added to half a glass of water, and a teaspoonful given every hour or two, will afford the best satisfaction.—*Webster's Dynamical Therapeutics.*

By H. W. Felter, M. D.:

Apis is diuretic, alterative, and diaphoretic. It specifically influences the urinary tract, small doses somewhat resembling cantharis in action, in removing irritation, and in larger doses, stimulating the renal organs and other portions of the urinary passages. The small dose may be employed if there be irritation, even though inflammation exists. Aconite, veratrum, and like agents, promote the action of apis, while ammonia and alcoholic liquors are antagonistic to it. It is specifically indicated where we have hot, burning, dry, itching surfaces; and where there is constant desire, but inability to urinate, the urine being dark-red in color. Apis is one of the most certain diuretics in the materia medica, and is of very great value in **suppression** and **retention of urine** from atony. It may be used even when there is active inflammation: *R.* Specific apis, gtt. v. aqua, fl. oz. iv. *Mix.* Teaspoonful every hour, or use an infusion of from 15 to 20 bees in water, 1 pint, for the usual urinary difficulties indicated above. It is a very useful remedy for **urethral** and **cystic irritation**, with burning, stinging pain, and constant and annoying **tenesmus**. **Chronic nephritis** and **cystitis** are sometimes cured by it. It serves a good purpose in diseases of women characterized by heat and a sensation of burning, with pain in the bladder and urethra, and constant desire to pass water. These conditions are relieved by it, quicker than by any other agent. In **menorrhagia**, **amenorrhea**, and **leucorrhea**, with acute congestion of the ovaries, or in simple **ovarian congestion**, the parts being tender and painful, apis often gives prompt relief. **Genital puffiness** with irritation and **labial inflammation** of the same character are cured by it. *R.* Specific apis, gtt. x; aqua, fl. oz. iv. *Mix.* Teaspoonful every four hours. Owing to its power of relieving **renal irritation** and **engorgement**, thereby increasing function, apis is an exceedingly useful agent in **anasarca**, **ascites**, and **hydrothorax**, provided the kidneys are in an active condition. For these troubles; *R.* Specific apis, gtt. v.; aqua, fl. oz. iv. *Mix.* Teaspoonful every hour. It is particularly useful in **post-scarlatinal dropsy**. **Inflammatory sore mouth** is benefited and often cured by apis. Sore throats, of an edematous character, having a uniformly spread puffiness, as if the submucous tissues were involved—the parts appearing as if stung by a bee—are relieved by apis. These conditions are frequently met with as a complication of **erysipelas** and in the **angina of scarlatina**. It is often a prompt remedy for **vesicular erysipelas**, and for all **subcutaneous inflammations**, with burning, stinging, tensive, and lancinating pains, and dermal irritation. We have no better agent for the treatment of **urticaria**, or "hives," with soreness and intense itching, than apis. Puffiness is a strong indication of cutaneous diseases, and in **traumatic injuries** of the subcutaneous areolar tissues, it is often indicated by this symptom. It is a good remedy in **rubeola** and **scarlatina**, the usual indications being present. That form of **rheumatism** having the peculiar symptoms otherwise indicating apis will be found to respond oftentimes to this remedy.

Specific Indications and Uses.—Itching, with burning of the surface,

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especially of the genitalia or urinary passages (Scudder); hot, dry, burning, stinging, or irritation, the parts appearing as if stung; hives; vesical and urethral irritation, with constant desire, but inability, to urinate, the urine being deep-red; puffiness of parts with tendency to edema.—*King's American Dispensatory* (Felter-Lloyd).

BEE STING IN RHEUMATISM.

It will be observed that one or two of the foregoing authorities have mentioned the subject of *Apis in Rheumatism*. The use of the remedy for this affection has been recently commented upon by many writers, some of whom could certainly not have heard of its previous employment in that direction. In 1904, at the meeting of the Kansas Eclectic Medical Association, a paper on this subject was read by Dr. E. B. Packer that attracted much attention, as it embodied Dr. Packer's experience in a case that came accidentally to his attention. This paper is thus reproduced:

My case was as follows: A Mr. Gardner, of this city, had been laid up with articular and muscular rheumatism for four years, and had been unable to walk any distance, and that only slowly and with a pair of crutches. In August, 1903, he was hobbling around the yard on his crutches and accidentally got his crutch caught and had a fall. In falling he fell against a hive of bees and upset it. The bees, enraged at such treatment, pounced on him by the hundreds, and before he could be rescued by his wife was nearly stung to death. After the stinging he was very sick from the absorption of so much of the virus from the stings. He vomited freely and often for about twenty-four hours, after which he got better, and found he had no more rheumatic pain. Nor has he had any rheumatism from that time to the present.

In a letter, dated January 30, 1909, Dr. Packer states:

I saw Mr. Gardner yesterday on the street, and he says that he has never had a rheumatic pain from that time to this, and that if he thought another stinging, such as he had then, would release the ankylosis of the knees and ankles and back that is the result of the rheumatism, he would go and kick over the first hive of vicious bees he could find, notwithstanding the fact that the former stinging nearly killed him.—*E. B. Packer, M. D.*

In the *Medical Arena*, June, 1904, a report was published from Dr. P. C. Gress, of Atchison, Kans., in which the sting of the bee was utilized for the cure of a long-standing case of rheumatism. From the good results obtained in these two cases, both Dr. Packer and Dr. Gress were encouraged to continue the use of this heroic method of treatment, as evidenced by another extract from the letter of Dr. Packer, above referred to:

Dr. Gress and myself have been treating rheumatism with bee stings for the past five years, but of course the treatment has not been as vicious as that reported in the case of Mr. Gardner. From 3 to 5 stings, at as many sittings, will produce all the relief required. I usually extend the sittings from five to twenty days, and I never use the second bee before the swelling or irritation from the previous sting is gone.

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In December, 1908, probably without any information concerning the experience of Dr. Packer, Dr. E. T. Burton, of Birmingham, England, reports in the *British Medical Journal* the beginning of his use of the sting of the bee in several seemingly hopeless cases of rheumatism, and in March, 1909, of the same journal, records his further experience as follows:

By E. T. Burton, M. D.:

Case 1. A man, aged 76, tells me he has suffered not for ten, but fifteen years. He is continuing the treatment at the rate of twelve stings a week, and the pain which "left his hips and went into the thighs" changed its position to the knees on December 16th; on December 30th it returned slightly to the left hip, and on January 12th moved to the calves of both legs. He had only had fifty bees on the last date, having been shy at the pain in the commencement.

No. II still has some intercostal pain, but very much shorter in duration. She gave up the bees, but recommenced them after ten days.

No. III is coming to Birmingham again to have more bee stings, as he has been much freer from pain, which is much less, especially at night.

No. IV continues quite free from pain and is in excellent health.

The following cases are new:

No. V. F. C., a mechanic, aged 34, suffered from sciatica for eighteen months. For four months he was under the care of a private medical man who ordered him to Droitwich, where he had the usual baths for fourteen days. He went there also for the next eight or nine week-ends, having on each occasion four baths. He returned little improved, and attended a hospital for fourteen days as an out-patient. After that for four months he was treated at the same institution by massage, and the galvanic battery, but without relief. On November 27th he commenced with twelve bee stings, which were repeated every week for six weeks. In five weeks there was marked improvement, and when I saw him last, on January 16th, he said he had been getting steadily better, so that he frequently did not know he had sciatica. He had had, up to the last date, one hundred bee stings.

No. VI. K. H., a married woman, aged 36, had during the past three years suffered from rheumatism and arthritis in the jaws, hips, knees, feet, elbows, wrists, shoulders, and hands. The bees were applied first on December 1st, and she had twelve every week till January 4th, or sixty in all. "Results: Rheumatism nearly gone from the shoulders. Right wrist a little free. Right arm not quite set, but apparently released a little. Not so much pain generally. For the past two years there was incessant acute pain, whether active or idle."

No. VII. E. N., a single woman, aged 35, had suffered for three years and a half with rheumatoid arthritis in wrists and fingers, which are much deformed, and also in the ankles. She had been treated as an out-patient at a hospital and was an in-patient for ten weeks, when, she says, she "received some relief from the rest from work." She commenced the bee stinging on November 21, 1908, and on January 16th had had sixty-six stings. The grasp was much stronger, the wrists, fingers, and ankles more movable, stronger, and quite free from pain. Her nights, which had been frequently very bad, are much better.

No. VIII. H. D., a mechanical engineer, aged 54, was lamed by a kick above the left knee when ten years old, and had some bone removed. For the past thirteen years he has been gradually getting worse in the other leg from increasing sciatica. On January 8th and each of the following dates I applied eight bees to the region of the sciatica nerve—for I am satisfied that the stinging is not only antitoxic, but also counter-irritant—and on the following day he told me that before stinging he had to hang on to various articles of furniture to assist him crossing the dining-room, but when he returned home, after being stung, he could do so without assist-

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ance. On January 11th his leg felt stronger and he could walk better. On January 13th he said he had less pain on leaving bed, and much better nights since January 8th, but followed by considerable pain in the day. He was better on January 15th, and his nights were still good. Walking did not seem so firm. There was a large, circular, inflamed patch over the trochanter. The last application of bees was followed by severe inflammation along the thigh. On January 19th the leg was not so strong, and there was increased pain. On January 22d he reported that he had more pain in the day, but the nights were very much better. On January 25th the pain was still severe, particularly in the femur. On January 29th pain followed in the right hip joint. On February 2d there was great stiffness in the thigh and knee-joint, and he was compelled to walk more slowly. On February 5th there was no improvement; but he was no worse. This gentleman seems to be losing heart, but, after thirteen years, cure can not be expected under a month, and after only one hundred bees have been used. He is continuing the treatment.—*British Medical Journal*, December, 1908.

As to my own case, up to January 22d my progress was most satisfactory. I continued to apply two lots of bees a week, and in all, 271 to that date. I had slight twinges of muscular rheumatism of not more than a few minutes' duration, for which reason I persevered with the treatment. But on that day I contracted a chill and suffered at night some pain in the glutei and right sciatic nerve. I at once put on eleven bees, and slept well, the pain next morning being much easier, and permitting me to work. On January 23d, after a long harassing day, I got to bed tired at 10 P. M. and applied fifteen bees, and on January 24th only had slight pain in the glutei, none in the sciatic. I made a necropsy for the coroner at 6.30 P. M. in a fireless mortuary, with a glass roof, the temperature being below freezing. On January 25th I attended the inquest in a court with mercury at 70°, the external temperature being 25°. I applied twelve bees on January 24th, and eight on the following day. On January 26th I had great pain in the glutei, and on January 29th this was increased on walking. I applied fourteen bees, and was better on January 30th, but still had some difficulty in walking. On Sunday, January 31st, I rested in bed all day, and applied eight bees at night. From February 1st to 7th the pain varied. On February 3d and 4th there was much pain after walking, and I applied in six days forty-five bees. On February 20th I was entirely free from acute pain, but still continue the stinging. I am taking no other medicine, and, but for occasional transient pain, feel very fit, and have, as one of my old ladies says, a very "avaricious appetite."—*British Medical Journal*, March, 1909.

Following these reports Dr. Burton adds a few words concerning the pain incident to the treatment:

I have been asked frequently as to the pain of stinging. After the first three stings on myself, I find that the intensity of the pain is much less lasting than at first—in fact, is over in half an hour at the most. Some of the bees seem to cause greater pain than others, but I think this may be explained by a larger cutaneous nerve being wounded by the sting. I hope that shortly your readers will have, from his own pen, the experience of another Birmingham practitioner, who tells me he has found great relief to old-standing sciatica from this treatment.

That the use of the sting of the bee in rheumatism is broadly disseminated is evident, an Austrian physician, Dr. Terc, claiming to have successfully treated seven hundred cases, as shown by the following extracts:

"There is a widespread popular belief in England, and, indeed, throughout Western Europe, that stinging by bees is a cure for rheumatism and allied ailments. Over a year ago Dr. Ainley Walker, of Oxford, asked

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the chief medical and scientific journals for trustworthy evidence as to the success or failure of this popular treatment. The poison which the bee injects is formic acid, and Dr. Walker's attention had been drawn to the popular belief by certain observations of his own 'which seemed to suggest a possible relationship between some of the phenomena of acute rheumatism and abnormal production of formic acid in the body,' under the action of a micro-organism. He has now received, says **The Manchester Guardian**, an interesting body of mainly favorable testimony, much of it from medical observers. But the most interesting evidence of all is that of an Austrian, Dr. Terc, who has been using the treatment systematically, as he claims, successfully for years, and has dealt with seven hundred cases.

"Dr. Terc published an account of his method and results twenty years ago, but his paper was generally ignored. He has found that a rheumatic subject is less susceptible to bee stings than a healthy person; the secondary swelling, which normally lasts a few days, fails to appear. His treatment is to continue the stinging until a stage is reached when even a rheumatic subject this swelling begins to appear. At this stage, there is a marked improvement in the rheumatic symptoms. The stinging is then carried on until a further stage is reached, when the swelling again fails to appear, however many stings are applied, and this development of immunity to stings is accompanied by a complete cure for rheumatism, the cure enduring as long as the immunity remains. Sometimes a dozen stings complete the whole process; sometimes hundreds are necessary.—*Unde Advertiser (The Pharmaceutical Era, January 14, 1909).*

BEE STING FATALITIES.

Notwithstanding all this, the heroic method of procedure by the direct sting of the bee, will not appeal to many persons, nor, for obvious reasons, ever be very popular. Besides, the sting of the bee is not without danger. Deaths even occur from a single sting, as is often reported, the following being statements of fact:

In the summer of 1866 the wife of Dr. Albert von Donhoff, of Louisville, Ky., while engaged among the flowers of her garden was stung (in the temple I believe) by a honey-bee, and notwithstanding the prompt assistance of her husband, one of the most experienced physicians of the period, she died within a few hours after the accident.—*C. Lewis Diehl.*

Mr. John R. Stanbery, of Powell, Delaware Co., Ohio, (father of Mrs. Mary S. Watts, of Cincinnati), who had been previously stung several times by both honey bees and bumble bees, lost his life by reason of a bee sting. The tragic event is thus described by Mrs. Watts:

"The final stinging occurred on a very hot August day, when he had gone out to the clover-fields to watch the men cutting the clover-hay. He walked directly into a nest of bumble-bees; half a dozen of the men saw him, and ran immediately to his help. They fought the bees off, but it was too late. He spoke once, saying in reply to their questions 'whether he had been stung,' 'I'm very sick,' and became unconscious. He was hurriedly taken to his home, the services of a physician being at once secured. But, although everything possible was done, he died in twenty minutes. It was discovered that he had been stung six times, directly on the pulse. When his hand relaxed after death, a dead bee was found clenched tightly in it. 'Perhaps I ought to emphasize the fact that my father was a very temperate man, and had been so all his life. He was in robust bodily health at the time of his death.'

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Apis in Rheumatism.—Dr. Felter, in the *American Dispensatory*, gives the following suggestions concerning the use of Specific Medicine Apis in the treatment of rheumatism, instead of by the direct sting:

That form of rheumatism having the peculiar symptoms otherwise indicating apis, will be found to respond oftentimes to this remedy. We have known of well authenticated cases where individuals suffering from rheumatism have been cured of that complaint after having been severely stung by the hive-bee. We do not recommend this form of hypodermatic injection, but prescribe for rheumatic conditions with blanched puffiness and the peculiar stinging pain, as follows:

R Sp. Med. Apis, gtt., ... v,
Water, ... ℥iv.

M. Sig. Teaspoonful every two or three hours.

—*American Dispensatory (Felter-Lloyd), Vol. I.*

Treatment of Bee Sting.—Ammonia water applied to the part stung is useful. Bruised green stramonium leaves is a domestic remedy. Libradol is the best palliative known to us. Plastered over the stung part, it gives instant relief. Remove the sting if it is left in the flesh and at once cover the part with Libradol. The pain disappears and the swelling quickly subsides.

HONEY (MEL) AND WAX (CERA).

Both honey and wax are employed in medicine and in pharmacy, having been, in former times, very important. At present, sugar and glycerin have largely displaced honey as a sweetening agent, whilst the many uses ascribed to it in ancient and mediæval therapy are now forgotten and unknown. Wax has also been largely displaced by paraffin and spermaceti, whilst petroleum greases and paraffins have rendered wax cerates and ointments unnecessary. There is no reason why honey should not be considered as possessed of as varying energetic qualities as is true of its many flavors. Whoever has eaten of the renowned honey of Athens, made from the mountain flowers of Greece, or the fragrant white clover honey of America, and contrasts therewith the insipidly sweet honey made by syrup-fed bees, will certify to the marked differences in flavor. It is well known that the flowers of the jessamine and poppy are possessed of narcotic properties, and these, combined with the products of organic life processes imparted by the bee under peculiar conditions, are sufficient to render this a rational conclusion. Indeed, naturally medicated honeys are on record, of which the following is a sample:

"Honey Mad."—In the flowering season of the opium poppy, bees make a honey possessed of narcotic qualities, such honey being known as **"Mad Honey."** Partakers of it wander aimlessly about, talk incoherently, and appear crazy. It is not a soporific, seemingly having quite different qualities from morphine. That the affection is not serious, however, is evidenced by the fact that, in Harput, Turkey, when Mrs. Thomas H. Norton, wife of the American consul, inquired what possessed a man under its influence, the reply was to the effect that he was only **"Honey Mad."**—*John Uri Lloyd, "A Treatise on Opium," 1908.*

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In like manner, wax may be possessed of various qualities. Indeed, wax may, of itself, modify the action of honey. For example, this writer can eat freely of honey mixed naturally with the comb, without any discomfort, whilst strained honey, as a rule, produces crampings and pain.

The importance of honey and wax in the therapy of former times is shown by Mouffet, whose summary carries such a fund of references and of quaint applications, as to lead us to present his article entire. In these will be perceived the origin of the Pharmacopeial preparations, past and present, of both wax and honey, such as honey of roses, borated honey, etc.

THE MEDICAL VIRTUES OF HONEY (MOUFFET).

As for the medicinal and physical virtues of honey; it causeth heat, cleanseth sores and ulcers excellently, wears them away, and removes them in what part of the body soever gathered: as **Galen, Avicen, Celsus**, and **Pliny** have observed. It perfectly cureth the disease which causeth the hair of the head or the beard to come off by the roots, called the Foxes evil, and other filthy ulcers of the head.—**Pliny**. To regain hair lost by the disease aforesaid, and for long (Agnes) it is very effectual, if the part be anointed with it raw as it is; or with the honey-comb newly drained or emptied.—**Galen**. But above and beyond all, the oil of honey distilled doth affect it. The water that droppeth from the honey, doth excellently cleanse the skin, provoke urine, extinguish the burning heat of fevers, open the obstructions of the bowels, quench thirst. The chalk or salt of it, as it is of all corrosives, the least painful, so it is most energetical and operative, and therefore is very much commended by Chemics and Surgeons for to cure that kernel or tumor of flesh which groweth upon the yard. But how many, and how ample virtues that quintessence of honey (as they call it) hath attained against the strength of all diseases whatsoever, is excellently described by **Isaacus Belga**, the predecessor of **Paracelsus**. Nay without doubt, if wild honey and raw was able to prolong the life of **Democrates**, **Pollio**, **John the Baptist**, in a word, of the **Pythagoreans**, and **Cyrneans** (as aforementioned), how much more will it do being refined, and heightened to the highest degree of nutrition? The **Epicureans** who took the best way they could to provide for their health and their pleasure, fed always upon **Ambrosia**, as **Tzetzes** reports, which did consist of a tenth part of honey; as if they meant by the use of it, to stave off all pains and griefs, and live free from all diseases and maladies. It doth wonderfully help the ulcers in the ears if it be poured warm into them, and especially if an ill scent be joined with them. Moreover in their hissing, noises, inflammations, **Galen** commands to instill Attick Honey, butter, oil of **Roses**, and as much warm water **Marcellus Empyricus** used to infuse into the ear that was pained. The same also very much commends honey mingled or kneaded with the ordure of a young infant, to cure the dullness of the sight, and the white spots in the eye. **Vegetius** says this means cures the watery eyes or dropping of the eyes caused by rheume or distillation. First of all, a little below the eye he draws blood and anoints them with the purest honey till it be whole. But yet care must be had (as **Columella** very well hints) that as often as the eyes are anointed with honey, they be besmeared round about with melted pitch and oil, lest the wasps and bees infest and hurt them. Hear also what **Marcellus** saith touching the clearing up of the eyes, and he prescribes this: The honey pure and neat wherein the bees are dead, let that drop into the eyes; or honey mixed with the ashes of the heads of bees, makes the eyes very clear. And again mingle Attick honey with the first ordure the infant makes, together with the milk of the nurse; and with that anoint the eyes that are so dull whatever the cause of it be; but first of all you must bind the patient to

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a form or ladder; for otherwise such is the strength of the medicine, that he will not be able to endure it. Which is such a present remedy, that in three days it will fully restore the sight, and take away every blemish of the eye. The gall of a vulture mingled with the juice of horehound (twice as much in weight as the gall is) and two parts of honey cures the suffusion of the eyes. Gal. in Euporist. Otherwhere, he mingles one part of the gall of the Sea Tortoise, and four times as much honey and anoints the eyes with it. Serenus prescribes such a receipt to cause one to be quick sighted.

Mingle Hyblean honey with the gall
Of Goats, 'tis good to make one see withal.

Give infants butter and honey, for nothing is better for their breeding teeth, and for sore mouths. Galen bids us rub their gums with nothing but honey. For it wonderfully helps to their breeding of teeth, preserving, cleansing and beautifying of them. Also against the pain of the jaws. li with Arabian honey you join field-poppy, it cures it. And sometimes pure honey is mingled with clear water, and this, as Serenus and Pliny testify, doth notably cure the dryness of the tongue in fevers, the quinsy, and the diseases of the uvula, throat, jaws, or the tonsils; against difficulty of breathings, and to cause one to expectorate, either by itself or mingled with other things is highly commended by Hippocrates. And for the convulsion of the laps of the lungs (which used to be a deadly disease), the drinking of cold water, and of that wherein a honeycomb is steeped is very effectual. Also, if the stomach be not hot, choleric, bitter, nauseating or feverish, it makes it strong and vigorous, and nourisheth it much, not suffering milk to curdle in it: it cleanseth the reins, boiled with water and butter it is good against the stone.—**Avicenna.** It easeth the pain of the spleen, but it must be outwardly applied with the dead bees; for taken inwardly it hurts both the liver and the spleen, saith Galen. When it is raw it looseneth the belly, but boiled with the bees, or with new cheese it bindeth the belly so much, that Galen holds it to be a secret against the Dysentery, and colic passions: so does Celsus, also Pliny. Hippocrates mingled honey with all medicaments that were to soften the belly. Honey mingled with rosin, is a cure for the cold testicles, as Pliny saith, who also affirms that the ashes of ox leather mixed with honey, cures all running sores and botches. Niter with honey and cow's milk cures ulcers of the face; and the froth of honey with oil of walnuts, amends the burning of the skin: it is excellent for old people and such as have cold stomachs; and being boiled, it discusses wind, and moves urine mightily.—**Galen.** Hollerius reckoneth honey amongst diaphoretics, because it openeth and maketh the passages clear: Galen placeth it amongst diuretics. It layeth down its acrimony by being mingled with water, or being boiled; and therefore Galen prescribes boiled honey, to close up ulcers that are hollow. Salt with meal and honey takes away the pain of a joint that is dislocated, discusses the swellings, and makes it more apt to be reduced. I might here set down the plaster of Aetius and Aegineta called Diamelleum, the Tapsinel of Arden, and all syrups that were anciently made of honey. In whose place the Neotericks have put sugar, but I know not by what reason. For if honey of Athens, or some as good, be at hand, and doth not want its due preparation, do not use sugar that is earthy, reedy and so full of dregs, not comparable either for use, original, or any way whatsoever with this heavenly dew honey.

Hydromel of Galen. Take sweet, pure clean fountain water, 8 pounds, the best honey 1 pound, boil them at a soft fire in an earthen vessel, take off the skin oftentimes, and boil it to its thickness. If it must be drunk presently, it must be made thin as water, if it just be set up to keep, boil it longer till it be thick, as a julep; if it be kept long it pierceth deeper into the parts far off, and is sooner converted into choler. Also boiling acquires to it many more faculties; for being little boiled, it inflates more,

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it purges more, and nourisheth less. Longer boiled, it dissipates wind, nourisheth more and purges less. It is spiced at pleasure, with ginger, saffron, Gallia Moschata, Lignum aloes. It is made also another way, of honey 1 pound, water 8 pounds, leaven 3 ounces; put all in a wooden vessel, leaving three or four fingers empty that it may work the better; when it hath one working stop the vessel and let it be well hooped, and after three months it will be fit to drink.

Hydromel of Pliny.—Take of pure rain-water that hath been kept five years, 12 pounds, boil it two-thirds, add to it a third part of old honey, and in the dog days set it in the sun for forty days, and letting it so stand, on the tenth day stop the vessel, this is called Hydromel, that with age will taste like wine, made nowhere better than in Phrygia. It was given to sick people that desired wine, but now it hath been forbidden for many years.

Hydromel of Aegineta.—Take the juice of bruised quinces, 5 pounds, fountain water Sextarii, boil them till they grow soft, take them from the fire, let them cool, then strain them, and crush out the quinces, and cast them away, add to this water half honey, boil it, scum it, till an eighth part be consumed; some make it of sweet apples or pears the same way.

Hydromel of Dioscorides is made of two parts of old rain-water, and one part of honey mingled, and set in the sun. Some call it Hydromel, because it is wont to be made of the washing of the honeycombs with water, but it must not be made stronger, because it will hurt sick people by too much matter proceeding from the wax. Hydromel after it has been long kept, is as strong as small wines, or Lora, being but half so old. Wherefore it is preferred before them in abating inflammations. The use of old Merhegim is condemned, for such as are inflamed or costive, but it is good for weak stomachs, and such as loath their meat, or sick people that sweat much, or for those that are thirsty, or after a burning fever have wasted away. Aetius describes a clyster only of honey and water to move the belly, and with the same he cleanseth hollow ulcers. Galen commends and uses Melicrate (wherein some hyssop, organum, or thyme or pennyroyal hath been boiled,) to prepare and purge gross humors in an acute disease, but he commends it not for the want of a stomach. Lately the English found out a new composition of Hydromel (they call it Varii) which serves better for ships than any wine. The preparation is this. Take barley torrested after due steeping in water what you please, boil it long in 5 quarts of fountain water, till it tastes well of the malt; 1 pound of this boiled with 8 pounds of honey and 20 pounds of water, makes a drink that tastes most sweet, and is most healthful for use. It nourishes well, is hardly corrupted, and keeps very long.

Oinomel, Spiced.—Aurelianus recommends it in the cure of sciatica.

Mulsum made of sweet new wine the Greeks call Nectar; to new wine sodden, they add a tenth part of honey; but this kind is offensive to the stomach and causes windiness; it is given to purge the belly. . . . The use of honied wine is this: 'It is given in long fevers that have weakened the stomach with crudities collected in it. It loosens the belly gently, it provoketh urine, it cleanseth the stomach, it is good for disease of the joints, faults of the reins, a weak head, and to women that drink no wine, for it is pleasant in smell, and nourishes the body. It moveth vomit drunk with oil, and it is profitable given to them that have drunk poison; as also for such as are weak, and their pulse is feeble; for such as are troubled with a cough, and a short breath, or imposthume in the lungs, and those that are wasted with extreme sweating. But then it is for to mingle it with Hydromel. Also Galen prescribes to them Melicrate qualified with water, that have had a shaking fit not above a week, and nature being yet strong. Some there are that utterly condemn this in fevers; but that must be understood of some times in fevers. Romulus, a certain guest of Cæsar's, being asked how he had preserved the natural vigor of his body and mind so long (for he was above a hundred years old), he answered, "With-

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out with oil, within with honey and wine sodden together, as Pollio did." That we may the more wonder at the use of Mulsum, which the Ancients esteemed very much, for that they were persuaded that all acrimony of the mind was pacified with sweet liquors, and the spirits made peaceable, the passages made softer and freer for transpiration, and that it was also physics for manners.—**Plinius.**

Also Gesner brought in an Oxymel with Hellebore, which he commends not a little in his Greek Epistle to Adolphus Otto. To make thin, thick and clammy humors, and to root them out; but especially to make way for insensible, transpiration, that is to draw forth from the center to the superficies of the body. But you shall find everywhere featured in the Book of his Epistles, what force it hath against Melancholy, Cachexia, Dropsies, Epilepsies, and fevers, where also you have the Oxymels made with Hellebore, both great and small.

Apomeli of Philagrius in Aegineta. It cools lightly, as Galen saith, wherefore in Phlegmone, and weariness in a fever, it is very good. It is drunk all the summer to cool the body, at which time any man may drink of it (especially when it grows sourish). It is also useful to expectorate with, to move urine, to purge the belly, and to cut thin humors. Aeginetas Ruelius.—*Mouffet, Theater of Insects, 1658, p. 906.*

MEDICINAL USES OF WAX. (MOUFFET.)

Great is the virtues of pure Propolis (Bee-glue),* upon the gross spir-its, and it draws faulty matter out from the depths. **Hallerius.** It is of the nature of wax, but it powerfully draws forth. **Dioscorides.** Celsus placeth it in the number of biting remedies, saying that it digests and moves matter in ulcers. Aetius says that it heats, discusses, ripens, cleans, attracts. The cleansing force is not very strong, the attracting is strong enough, it is of thin parts, it heats in the second degree complete, or in the beginning of the third: you must first soften it with your hands before you mingle it with other medicaments and then taking the rest from the fire, put it in and boil it, for it will not well endure any boiling at the fire. It draws out all thorns and all splints that are within. **Aetius.** Varro saith, that for its manifold uses it was sold dearer in the market than honey. Maybe therefore Propolis was called holy wax, because of Via Sacra where they sold it at Rome, as Largus writes in the cure of white swellings. They draw forth thorns and such bodies sticking in the flesh, with runnet (especially of a hare) powder of Frankincense and Propolis. **Pliny.** It helps an old cough with its smell. It cures the rose with water, and roots out ringworms by anointing them. **Dioscorides.** It cures Ozenas: Serapio, Pliny i. II. c. f. tells more of its physical use.—*Mouffet, The Theater of Insects, 1658, p. 617.*

PREPARATIONS OF APIS.

Physicians of the Homeopathic school of medicine employ a tincture of Apis, together with its dilutions and triturations, which are fully described in their works on pharmacy and therapeutics.

SPECIFIC MEDICINE APIS.

Preparation.—The only preparation we have devised is the *Specific Medicine*. It is of very complex structure, and seemingly depends on no principle of marked chemical individuality for its therapeutic

*The gummy substance with which bees stop up the crevices in their hives so as to make them perfectly dark. L

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qualities. It is made by placing freshly caught live bees in a box covered with a sieve, then shaking them until they are intensely excited. The bees are now quickly put into alcohol sufficient to cover them, and digested at a warm temperature for a month. The dark colored alcoholic liquid is then decanted, and the bees repeatedly extracted with 50 per cent alcohol, until exhausted. The liquids are all mixed together and brought to a strength representing two ounces of bees to a pint.

Qualities.—This, in thin layer, has a dark straw color, but in bulk presents a deep wine shade. It has a peculiar, wax-like odor, and a sweetish taste. Increase of alcoholic percentage in its preparation decreases the color, because of failure to dissolve the colored honey products, that are soluble in water but insoluble in alcohol. The larger share of the residue obtained by evaporation of Specific Medicine Apis is a natural compound of honey or related structures extracted from the bee, and having an acid reaction. This has no established therapeutic qualities, but may yet be valuable. Indeed (see **Honey**, this treatise), it has long been highly valued, and is sometimes very energetic. Since the natural honey has always been present in Specific Medicine Apis, we propose that it shall remain a constituent of this remedy. One drop of Specific Medicine Apis responds abundantly to Fehling's glucose test. If 25 Cc. of Specific Medicine Apis be abstracted with chloroform and the chloroform solution abstracted with dilute sulphuric acid, the resultant acid solution responds to Mayer's test for alkaloids.

The diluted Specific Medicine Apis, from which all the alcohol is evaporated, when acidulated with sulphuric acid responds, although but feebly, to Mayer's alkaloidal test. The venom of the bee, intensified by the previous shaking excitation, is of course one of the structural constituents of the remedy.

The therapeutic action of Specific Medicine Apis depends upon a complexity of organic unknowns. Whoever breaks these natural structures of virus, alkaloid, glucose, etc., etc., into fragments, expecting from the use of a single fragment, the success derived from the whole remedy, is destined to disappointment. In this connection we call attention to the following article descriptive of an energetic peptic enzyme derived from honey, believing that in the present state of professional tolerance the article will merit more consideration than would have been the case before the serum crusade.

New Peptic Enzyme from Honey.—A new proteolytic enzyme was accidentally discovered in honey in the following way: A solution of honey was concerted into mead by fermentation with yeast, and some of the mead having been kept in an imperfectly closed vessel underwent acetic fermentation. The honey-vinegar so obtained was agreeable to taste, and some of it was employed in pickling some herrings, but the next day it was found that the herrings had largely disappeared; a repetition of the trial showed that the liquid dissolved a considerable amount of the herrings and disintegrated the remainder. The vinegar was then examined, to discover the cause of this action; it contained 0.033 per cent. of nitrogen; when filtered it formed a clear liquid, which remained clear when saturated with sodium chloride and gave no precipitate with solution of potassium

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ferrocyanide or ammonium chloride and only a slight opalescence with three times its volume of absolute alcohol; it slowly gave a slight flocculent precipitate with nine times its volume of absolute alcohol. It showed a strong digestive action on herring and on hard-boiled white of egg when kept in contact with them for forty-eight hours at about 20°, but had no action if previously neutralized, showing that the enzyme, like pepsin, would only act in acid solution. In order to see if it was identical with pepsin, a 0.5 per cent. solution of the latter in dilute acetic acid was allowed to act on herring and white of egg; this appeared to have a weaker action than the mead-vinegar, and was therefore allowed to act for six days; the liquids obtained in the two cases were then compared. That from the digestion contained both albumose and peptone, as was to be expected, but that from the action of the mead-vinegar contained no peptone, but only albumose, and it appears therefore that the enzyme which it contains is not identical with pepsin. It may be the same as the blood-fibrin dissolving ferment which was extracted by Erlenmeyer and V. Planta from the bodies of bees. W. Lenz (*Apoth. Zeit.*, September 7, 1910, 678).—*Pharmaceutical Journal and Pharmacist*, November 19, 1910, p. 609.

SPECIFIC USES OF APIS.

By John Fearn, M. D.:

Specific Medicine Apis Mellifica is a renal eliminant, and may be used in both retention and suppression of urine. It is one of the best remedies for rough, red rashes on the skin, that burn and sting, and under favorable conditions eventuate in urticaria and erysipelas, these conditions probably owing their cause to impaired renal elimination. Apis is the remedy in throat troubles and diphtheria with much inflammation and edema, the soft palate looking like a waterbag, with burning and stinging. The same is true in diseases of women attended by burning and stinging, or in urinary troubles, burning and stinging in bladder and urethra, strangury, a constant desire to pass urine, with much pain and straining, but with only a few drops passed at a time, tinged with blood. In dropsies, post-scarlatinal and general, where limbs and abdomen swell and pit on pressure, Apis is valuable. Most troubles that can be relieved by Apis, are made worse by heat, and are relieved by cold applications.

Indications.—Itching, with burning of any part.

Use.—In diseases of the skin; when the urine is scanty; in irritation of the bladder or urethra.

Dose.—Sp. Med. Apis, gtt. v.
Water, $\frac{5}{4}$ iv.

Misce.

Sig.—A teaspoonful of the dilution every one to four hours.

Dose: (*Felter, American Dispensatory*), Sp. Med. Apis, 1-10 to 2 drops. The larger doses in dropsies; the smaller in cutaneous disorders and in vesical irritation.

PRICES OF SPECIFIC MEDICINE APIS.

14-lb package	.80c. each.	By mail, \$1.02.
7-lb package	\$1.50 each.	Not mailable.
1-lb package	\$3.00 each.	Not mailable.

Tela Araneæ.

(COBWEB.)

History.—Both cobweb and spiders have been generally used, in substance, by primitive peoples as an application to bleeding wounds, for the purpose of stopping hemorrhage, as is recorded in the earliest works of medicine, as well as by travelers, and as recited in most books on domestic medication. Their use was known to the American Indians, as well as to aborigines generally.

Cobweb was mentioned by Dioscorides (*Aldine Edition*, 1518, p. 50) as a remedial agent, as shown by the following passage, translated by Miss Margaret Stewart, M. A.:

"The Spider, which some call **holcus** or **lycos**, that is, **robber**, or **wolf**, when made into a plaster and spread upon a small linen cloth and placed upon the forehead or temples, thoroughly cures tertian agues. Its web checks the flowing of blood, and heals the inflammation arising from old ulcers, which have attacked a large area of the skin. There is also another species of spider which spins a white, slender, and abundant web. This, folded in a leather pouch, and suspended from the shoulder, is said to cure quartan agues. A decoction or infusion with roses relieves pain in the ear."
—*Dioscorides*, II: 68.

Came then the extravagances of "authoritative" Medieval medicine, as shown in the following:

"The fly-catching spider, wrapt in a linen cloth, and hanged on the left arm, is good to drove away a Quotidian, saith **Trallianus** (sixth century, A. D.). But better if any of them be boiled with oil of bay to the consistence of a liniment; if you anoint the arteries of the wrists, the arms and temples before the fit, the fever abates and seldom comes again. **Koronides** or **Koranus**.* A spider bruised with a plaister and spread on a cloth and applied to the temples, cures a tertian. **Dioscorides** (first or second century, A. D.) The spider called **Lycos**, put in a quill, and hanged on the breast doth the same. **Pliny** (first century, A. D.). That house spider that spins a thick fine and white web, shut up in a piece of leather or a nut-shell, and hanged to the arm or neck, is thought to drive away the fits of a quartane. **Dioscorides** saith he proved it to be true. Three living spiders put into oil, let them presently boil on the fire, drop some of that oil warm into the ear that is in pain, and it profits much. Or press out the juice of spiders with juice of roses, and put it in with wool. **Marcellus Empiricus** (380-408 A. D. or later). Pliny bids infuse them in vinegar or oil of roses and stamp them and then drop some into the ear with saffron, and it will still the pain certainly: **Dioscorides** affirms as much. **Sofratus** . . . saith, that **Cranocolapsus** (a certain spider) drowned in oil, is a present remedy against poisons, as the Scholiast of Nicander (second century, B. C.) professeth.

* A king of Persia, who wrote a work on natural history.

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Aetius (about 500 A. D.) for suffocation of the mothers, applied a cerate of spiders to the navel, and said it did great good.

Also that knotty whip of God, and mock of all physicians, the Gout; which learned men say can be cured by no remedy, finds help and cure by a spider laid on.

Antoninus Pius (86-161 A. D.) was wont to say, that the quirks of sophistry were like to Spiders' Webs, that had a great deal of art and ingenuity in them, but very little profit. But how often hath the blood run forth from the body most miserably by a fresh wound? Yet it had been easy to have stopt it by laying on a spider's web.

The spider's web is put into the unguent against Tetters, and applied to the swellings of the fundament, it consumes them without pain. **Marcellus Empiricus.** Pliny saith it cures runnings of the eyes, and laid on with oil, it heals up wounds in the joints. Some rather use the ashes of the webs with Polenia and wine. Our chirurgians (surgeons) cure warts thus: They wrap a spider's ordinary web into the fashion of a ball, and laying it on the wart, they set it on fire, and so let it burn to ashes, by this means the wart is rooted out by the roots, and will never grow again. Marcellus Empiricus was wont to use the web of spiders found in the Cypress tree in a remedy for the Gout to ease the pains.—*Mouffet, "The Theater of Insects," 1658, p. 1023.*

Many of the illogical statements herein made have been brushed aside in the journey medicine has taken since that date. Let us quote as follows:

"Telia Araneorum, Cobweb.—Every one knows what this is, and how produced. It appears not in medicinal prescriptions, but as accident, for want of other helps, has taught its use to common people for stopping blood in a fresh wound. And this it seems to do by its extraordinary fineness; which makes it adhere to, and stop up the mouths of the vessels, so as to prevent the effusion of their contents."—*Quincy's Compleat English Dispensatory, 1749.*

"Araneorum Telæ Pharm. Edinb., Cobwebs.—These are applied by the common people for stopping the bleeding of wounds; which they effect, not by any styptic power, but by adhering to the part, and closing the orifices of the vessels."—*Lewis' Materia Medica, London, 1768.*

That the use of both the insect and its web were authoritatively considered as remedies, is evidenced in such works as *The New London Dispensatory*. Salmon (first edition, 1677), from the second edition of which, 1682, we quote as follows concerning the spider as a remedial agent:

1. **"The Spider** being made into a Plaister and laid to the Wrists and Temples cures Agues, chiefly Quartans. So also if they be put into a Nut-shell, and hung about the Neck. 2. **The least kind called Lycos,** applied to the Temples, Cures Tertians."

Although the date of the therapeutic introduction of cobweb and spider is lost in antiquity, cobweb has never been abandoned as a remedy, and that, too, notwithstanding the advent of cinchona, which now dominates the field in which cobweb was one of the former fa-

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vorites. Let us quote from *James' New English Dispensatory*, London, 1747:

"The web astringes and conglutinates, and is, therefore, vulnerary; restrains bleeding, and prevents inflammation. The country people have a tradition, that a small quantity of spider's web, given about an hour before the fit of an ague, and repeated immediately before it, is effectual in curing that troublesome, and sometimes obstinate distemper. This remedy is not confined to our own country, for I am well informed that the Indians about North Carolina have great dependence on this remedy for agues, to which they are much subject; and I am acquainted with a gentleman long resident in those parts, who assures me he was himself cured by it of that distemper. And, indeed, experience confirms the efficacy of this medicine in the cure of agues."—*James, New English Dispensatory*, London, 1747.

To the above we add from *Motherby's Medical Dictionary*, London, 1775:

Aranea, called also arachne, araneus, the catcher, the wolf, and spider. As is common to most insects, spiders abound with volatile oils, in consequence of which they are sometimes useful in agues, if taken inwardly. A scruple of the spider's web hath, in many instances, been given with success, an hour before the fit of an ague, and an hour after it. This produces no sensible effect, and may be given when the bark is not safe.—*Motherby's Medical Dictionary*, London, 1775.

This opinion concerning the harmlessness of cobweb, and its efficiency where cinchona is "not safe," voiced in different ways threads both domestic and professional publications preceding 1800. Together, it all forms the foundation for the more rational and restricted use of cobweb, or Specific Medicine TELA ARANEÆ, which may be traced to and into recent literature, as follows:

In 1821, N. M. Hentz published, in the *Journ. Acad. Nat. Sciences*, pp. 53-56, an article on "The Spider whose webb is used in medicine," from which we quote the introductory paragraph:

"It has been found lately, that the webb of a species of spider, common in the cellars of this country, possesses very narcotic powers, and it has been administered apparently with success in some cases of fevers."

In his paper, Mr. Hentz not only adds nothing to previous recorded uses of cobweb, but, by mistake, the wrong spider is figured in the plate accompanying his paper.

Close following, in 1831, John Redman Coxe, in his *American Dispensatory*, gives to cobweb a full page of fine print, from which we extract as follows:

"It would scarcely be supposed that this article would have engaged the attention of physicians, as useful in the *Materia Medica*; and it may serve to show how little capable we are of estimating the value of anything in this respect, except by experience and observation. It seems to have been long overlooked that it was formerly employed—and has lately been again introduced to notice. The following notices from different works contain the principal facts I can collect relative to it:

"In the *Medical and Physical Journal*, vol. 21, p. 353, will be found an interesting paper on this subject, by Dr. R. Jackson, in which he states

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the success of Dr. Gillespie, of Edinburgh, in curing an obstinate intermittent with cobwebs, after other means had failed. He was led from this to try it himself, and has given several instances of its perfect efficacy, even when of long continuance; and he is led from those cases 'to consider cobweb as possessing the power of suspending the course of intermittent fever with great certainty.' And elsewhere he concludes, that it 'possessed an extraordinary and altogether an inexplicable power in calming irritations, and in diminishing the excess of bodily torments'—hence he was induced to try it 'in the deliria, pains, spasms; and subsultus, common in fevers of the continued class.' The effect far exceeded his expectations. He likewise effected perfect cures in some troublesome spasmodic affections; and gave it with the most marked benefit in dry, irritating coughs, usually termed nervous, singly, and sometimes conjoined with opium. In the advanced stage of phthisis, it procured a respite beyond his expectation, one particular case of which he details. He further found it useful in restraining a troublesome hiccough. And he concludes by affirming, 'that cobweb diminishes morbid irritability, and calms irritations of both body and mind, in a degree far exceeding any drug or remedy within the circle of our knowledge.'—*Coxe's American Dispensatory*, 1831.

The *United States Dispensatory*, first edition, 1833, gives cobweb due remedial credit, citing several well known authorities. This view of the remedy was continued, in substance, throughout subsequent editions, with the added sentence that cobweb, stuffed into the cavities from which teeth have been extracted, stops the flow of blood.

"It is affirmed that the web of the field spider is inefficacious, while that collected in cellars of houses, etc., has extraordinary medical virtues. Several authors speak in very decided terms of its powers as a febrifuge and antispasmodic. According to Dr. Robert Jackson, it is superior even to bark and arsenic in the cure of intermittents, and is, moreover, highly useful in various spasmodic and nervous diseases, controlling and tranquilizing irregular nervous action, exhilarating the spirits, and disposing to sleep without producing any of the narcotic effects of opium on the brain. These praises are to a certain extent echoed by Dr. Chapman and Dr. Eberle, in their respective works on Therapeutics and Materia Medica. Among the complaints in which it has been found useful, besides intermittent fever, are periodical headache, the hectic fever of consumption, asthma, hysteria, and nervous irritations attended with morbid vigilance and irregular muscular action. It will be observed, that these are, for the most part, affections over which the imagination has much control. The dose of spider's web is five or six grains, to be given in the form of pill, and repeated every three or four hours. Dr. Jackson states that its influence is not in proportion to the quantity administered, and that he obtained the same effects from ten as from twenty grains. This might well be, if the supposition be allowed, that its chief operation is through the mind of the patient. Spider's web has also been used externally, with asserted advantage, as a styptic in wounds, and a healing application in superficial ulcers. Spiders themselves were formerly employed in the treatment of intermittent fever, and the application of the web to the cure of this disease is not a measure of recent origin."—*United States Dispensatory*, 1834.

King, in the first edition of his *Eclectic Dispensatory*, under the head *Tela Araneæ*, aims to balance the subject, as follows:

"The medicinal species of spider from which the web is obtained is the *Tegeneria medicinalis* of this country, which are found in cellars, barns, and other dark places; they are of a brown or blackish color. The web of the field spider is said to be of no account, medicinally, while that of the house spider is reputed to possess extraordinary virtues. There are

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various opinions among medical men as to the *modus operandi* of the cobweb, some attributing it entirely to the control of the imagination, while others view it in a different light, and entertain favorable opinions of it as a powerful therapeutic agent.

"Properties and Uses.—Febrifuge, sedative, and antispasmodic. Said to have been found useful in the cure of intermittents when all other agents have failed; also recommended in various nervous and spasmodic diseases, for the purpose of controlling and tranquilizing irregular nervous action, exhilarating the spirits, and disposing to sleep, without any narcotic action on the brain, as in periodical headache, hysteria, asthma, chorea, hectic fever, and nervous irritations attended with morbid vigilance and irregular muscular action. Dose, is five or six grains, every three or four hours, in the form of pill. Externally, it is asserted to have been advantageously employed as a styptic in wounds, and a healing application in superficial ulcers.

"The small silver-headed spider, given in a dough pill, is said to be a prompt and efficacious cure for ague."—*King's Eclectic Dispensatory*, 1852.

Mr. Thomas J. Graham, London, in his *Modern Domestic Medicine* states:

"The cobweb of cellars, barns, and stables, is a valuable remedy for ague (see *Ague*); and it also allays diseased irritability, and calms irritation, both of body and mind, often in a surprising manner. If it operates well, when the pulse is quick, frequent, irregular, and irritated, it becomes by its influence, slow, calm, and regular. Some American physicians who have taken it, say it produces a calm and delightful state of feeling, succeeded by a disposition to sleep. It will thus often tranquilize much better than opium or henbane, and its soothing properties point it out as a valuable palliative in the advanced stage of consumption—in asthma—in chronic hysterics, and in other spasmodic complaints.

"Cobweb is an old and popular remedy for the present fever, and it is as efficacious as popular. Some writers speak of it as a mere dirty object of vulgar superstition; but they are much mistaken, for ten grains of cobweb given twice or thrice before the expected time of each paroxysm, and continued in this way for three or four days, or longer, as circumstances indicate, will be found a powerful means of putting an immediate and permanent stop to the recurrence of the ague. The patient should, however, be prepared for its use by the previous employment of emetic, and purgative, as prescribed before beginning the bark. The only valuable cobweb is that produced by the black spider, which inhabits cellars, barns, and stables. It is sometimes very effectual in arresting the progress of the febrile symptoms in every other kind of fever. Dr. Jackson (*Dr. Jackson on Fever*, p. 241), a physician of acknowledged accuracy, and great experience in the treatment of fevers, observes, that it is more abrupt and efficient in its operation than bark, or arsenic, or any other remedy employed for the purpose, with which he is acquainted."—*Graham's Modern Domestic Medicine*, 1858.

The foregoing summarizes the therapeutic progress of cobweb, from the day of Dioscorides to and into the last century. The works of a multitude of authors might have been cited, each being about the same as the others. In it all, excepting in Homeopathic therapy and pharmacy, which are to be credited with much literature concerning spiders and their webs, as well as with explicit differentiation as regards the species to be used, it will be observed that (even by Dr. Jackson), the cobweb, itself, in substance, was used, in the form of a pill, or powder.

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The original article of Dr. Robert Jackson, so often referred to in the foregoing articles, appeared in *The Medical and Physical Journal*, London, England, in May, 1809. In that year cobweb was revived as a therapeutic agent, through a discussion in the British medical journals, following the aforementioned article by Dr. Jackson, from which we extract and condense, as follows, using, for historical purposes, the language of the author.*

By Dr. Robert Jackson:

"The spider's web (vulgarly cobweb) is known to many of the common people as a cure for ague and fever; but I believe that few of the regular practitioners have yet employed it on that, or any other account.

"In the year 1800, the late Dr. Gillespie, physician in Edinburgh, a man of sound professional judgment, and of great candour and sincerity of character, mentioned to me, by accident, that once, when baffled by the obstinacy of an intermitting fever, he had recourse to this vulgar remedy; and with the most perfect success. In the same year, and soon after I went to Chatham to the army depot, I met with some intermittents, which, if suspended for a time by bark or arsenic, were still liable to recur, and which I did not on that account consider as effectually cured, or disposed to be

* Dr. Robert Jackson enjoyed a conspicuous reputation in clinical practice, as well as in an official position in the English Army and Navy service. He began his professional career in 1774, in charge of the medical department of the first battalion of the 60th regiment in the island of Jamaica, although he had been a practitioner of medicine, in a general sense, preceding that date. In 1778 he volunteered for service in the war with America, and was attached to the 71st regiment. He made a specialty of the study of fevers, in which his service in Jamaica and the southern portions of America gave him exceptional opportunities. In 1791 he published "*A treatise on the Fevers of Jamaica, with Observations on the Intermitting Fever of America*," embodying therein the results of his studies between the years 1774 and 1782, together with his studies thereafter to the date of publication. He next traveled over a great portion of Europe, surveying medical and literary institutions, establishing himself finally at Stockton-upon-Tees, in the County of Durham.

At the time of the French Revolution, in 1793, Dr. Jackson took service with an expedition under the command of General Sir George Gray, accepting the Surgeoncy of the third regiment of foot, then embarking for the West Indies, where he hoped to study tropical fevers, but in this he was disappointed, by the deviation of the regiment to Flanders, where he had the opportunity of studying contagious fevers, instead. In 1795, before he had the opportunity of publishing his observations on contagious diseases, he was ordered to the Island of Saint Domingo, where he studied endemic diseases, writing continuously his observations of the history of diseases and clinical cases at the bedside. In 1798 he published the results of his fatiguing researches, under a long title, including *Fevers, Contagious and Endemic, Yellow Fever, etc.*, etc.

In the year 1799 he was appointed superintendent of medical concerns of a body of 17,000 Russian troops. His success in this direction led to his appointment as head of the Army Depot Hospital, in Chatham, from which he subsequently resigned, retiring to his former residence at Stockton. In 1803 he published a work on the Medical Department of the British Army and its Hospital Management, with an Appendix concerning fevers and the operation of remedies in effecting a cure. This work was followed, in 1805, by "*A System of Arrangement and Discipline for the Medical Department of Armies*."

In 1811, Dr. Jackson returned to the army medical service, engaging therein in the Barbadoes and other islands and colonies. In 1815 he returned to England, and issued a further study of the *History and Cure of Febrile Diseases*, followed, in 1820, by a two-volume work, largely devoted to tropical and other fevers. In 1819, the yellow fever having broken out in Cadiz, Dr. Jackson sought service in that location. Failing to secure an appointment, he traveled through the Orient, visiting such places as Constantinople, Smyrna, and the islands of the Archipelago, studying fevers, the plague, and similar diseases. In 1825 he published an article on *Epidemic Yellow Fever*, as it appeared in the Southern coast of Spain since the year 1800, thus completing almost a lifetime in the study of febrile diseases, although continually experienced in the direction of general medicine and medication.

Dr. Robert Jackson died on the 6th of April, 1827, in the seventy-seventh year of his age. He was exceptionally entitled to credit as an authority on fevers, for which reason authorities in all schools of medicine gave him due recognition, even into the present day, as is evidenced by the continual references to Dr. Jackson's commendation of cobweb as a fever remedy, in every phase of literature concerning that disease. This fact also renders it just that his report on cobwebs should not be passed without due regard to his experience and balanced opportunities in that direction.

Do not confuse this Dr. Robert Jackson, whose publications appeared from London, with the Dr. Robert Jackson, also an eminent authority, whose publications appeared from Edinburgh; nor yet with Dr. Samuel Jackson, of Philadelphia, who, in the beginning of the last century, formulated the compound known as "Jackson's Cough Syrup," yet lingeringly prescribed throughout America.

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effectually cured by these customary and ordinarily powerful means. But I shall state the case briefly, that you may be enabled to judge more correctly of the result. Serjeant Anderson, a respectable soldier, has been long harrassed by this complaint, and though he had been treated with all care and attention, there was yet no fair prospect from all the trials that had been made, that the disease was to be soon overcome. I was interested for the man on his own account, and I was also disappointed at the failure of my own endeavours; for intermitting fever was a disease of which I had had much experience, and, in accomplishing the cure of which, I had seldom failed. The obstinacy of the case brought to my mind the fact which had been mentioned to me by Dr. Gillespie; and as I thought myself perfectly safe in giving credit to Dr. Gillespie's testimony concerning the power of the cobweb, I desired that some of that substance should be carefully collected from the cellars, and made into pills of five grains each. As I was desirous to ascertain the effect precisely, and from my own observation, I administered, with my own hand, one pill about two hours before I expected the recurrence of the paroxysm, and two more a few minutes before the usual time of the paroxysm's return. The patient was ignorant of the nature of the substance that was given to him, and thus could not be supposed to be acted upon through imagination; yet the effect was perfect. The usual periods past without return, or without the most remote feelings of it; and though I considered the disease as cured, yet as it had been of long continuance, and had considerably enfeebled the powers of the constitution by its continuance, I recommended a furlough on account of change of air, so soon as I was satisfied that its course was completely arrested. Besides Anderson there were then three others in the hospital ill of intermitting fevers. These cases were also untractable; and as the success of the cobweb had been so decided in the instance of Anderson, I was desirous to ascertain the extent of its virtues by farther experiment in theirs. I accordingly administered, with mine own hand, a pill to each of the persons alluded to, about two hours before I expected the return of the paroxysm, and two more a few minutes before the time at which it had been accustomed to return. The success was perfect in all the three.

"A soldier of the Buffs, recently returned from the West Indies, was brought to the hospital, as having had a severe paroxysm of fever the preceding day. I have no note of what was done for him on the day on which he was received; but next day, while I was visiting the patients in the ward in which he lay, I observed the commencement of his paroxysm, and I perceived it was marked by such collapse and ghastliness, that, had I not known the nature of the case, I should have been apprehensive that the man was in the act of dying. I immediately gave him a cobweb pill (for a dispenser of medicine attended while I visited, and cobweb pills were among the hospital formulæ); in less than a minute he was perfectly tranquil; he even expressed comfort and satisfaction in himself that appeared unaccountable, and which I must confess surprised me, the change being sudden and complete, as if from the effect of a charm. The pulse was now calm and orderly; a very gentle but warm perspiration took place immediately, and health was instantly restored.

"I have thus noticed, in a cursory manner, the power of cobweb in preventing the recurrence of the intermittent paroxysm, in allaying the irritations, and in suspending the course of the paroxysm when actually begun, and in tranquilizing patients who are irritable in the extreme in other conditions of fever, viz., outrageously delirious, or otherwise agitated in body and mind. I now farther add, that the trials were extended, and that perfect cures were effected in some troublesome spasmodic affections; even that respite was procured in others that were fatal in themselves, and that seemed to stand beyond the reach of other means. I have thus given cobweb, with the most marked benefit, in cases of dry, irritating coughs, usually termed nervous, sometimes singly, sometimes joined, and I think advantageously joined, with opium.

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"I have also given it in advanced stage of phthisis, where it procured a respite, of which I could scarcely have entertained expectation. I mention a case in detail, that you may obtain a better idea of the nature of the effect. A young man, of a consumptive family, was attacked with what was considered to be a cold, about last Easter. The complaint went on to increase, and when I saw him, which was in the month of August, phthisis was completely confirmed; the pulse was small and frequent, rarely, if ever, under one hundred strokes in a minute, sometimes far above that number; the flesh wasted fast; the strength was greatly impaired; the expectoration was in great quantity, and decidedly purulent; the cough was extremely troublesome; the voice hoarse, and withal, there were occasional pains, or stitches, in the sides and breast. The hectic was perfectly established, and no person could, in conscience, entertain any reasonable hopes of recovery. Emetics and blisters repeated at intervals, with other means commonly known and usually employed in similar cases, procured occasional respites, but they made no decided impression on the course and character of the disease. About the beginning of October, the distresses were urgent; the cough was almost incessant, so that the young man had scarcely any rest during the night; the pulse was so frequent, and at the same time so small, that it was scarcely possible to number it; the legs swelled as high as the knees, and the strength declined rapidly. His friends were anxious in the extreme for relief, and the apothecary who attended him, and who had exhausted all the means from which relief is usually obtained, wrote to me, soliciting strongly that I would think of something that might mitigate his sufferings, for to give a favorable turn to the course of the disease was not expected. The tranquilizing effects of cobweb occurred to me on this occasion, and I suggested to the apothecary, who was a man of discretion, to prepare some pills of five grains each, and to give one of them at bedtime, or at any other time when cough or pain were distressing. He did so, and in about ten days I received a letter from him, stating that his patient was so much improved, that his friends were in great expectation of his doing well, and requested that I would visit him (the distance was near thirty miles), to satisfy them on that head. I went to see him, in compliance with the request of the parents, and found, on inquiry, that he had rested tranquilly the first night after he took the cobweb, and tolerably well the most of the succeeding; that the irritation and distressing cough had abated; that the expectoration had not diminished materially in quantity, but that it came up easily, that the strength had improved, and that the swelling of the legs had nearly disappeared. The mitigation of the symptoms was obvious, but the disease still existed.

"A gentleman of my acquaintance had for several months been extremely indisposed; the complaint complicated, but the nature of it not clearly understood. The joints, particularly the knees, were swelled, and extremely painful; the flesh was much wasted; there were frequent chills and occasional feverishness, especially towards evening; the pulse was small, irritated, and frequent; the appetite was, notwithstanding, better than might have been expected; the tongue was clean; the eye clear; the thirst considerable; there was evident hectic, but it was difficult to say on what it depended. There were suspicious, indeed, marks of a venereal taint, and he was kept under the influence of mercury for six weeks or two months, during which time the pains in the joints increased; the flesh wasted fast; and he was reduced to a state of great weakness; distressed, at the same time, by restlessness and want of sleep. Fidgetting, irksomeness, and desire of change of posture were extremely annoying. In bed he had no rest, it not being in his power, during the greater part of the night, to keep his limbs in one posture for ten minutes at a time; nor was he sensible that he had slept two hours at once for the last three months."

In this case, which had resisted all other remedies, Dr. Jackson prescribed cobweb, and reports as follows:

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"He rested calmly till morning; and, in repeating the pill afterward, he uniformly found that, though he might not actually sleep, he was not only enabled but disposed to lie in one position till the morning. He observed to me that, when he took opium, his mind was engrossed with some foreign object, his attention was thereby diverted from his local pains and uneasiness, but that he was much disordered next day; that when he took cobweb, of the nature of which he was ignorant, his mind was his own, but the sensations of pain and uneasiness were blunted, or obliterated, in a manner he did not understand, and that next day he felt no inconvenience of any kind."—*London, No. 3 Canton-Square, March 20th, 1809.*

In these early observations by Dr. Jackson, we have the therapeutic effect of cobweb contrasted with that of opium.

Came now into the discussion Dr. James Scott, surgeon of the English Navy. From the *Medical and Physical Journal*, London, Vol. XXII, pp. 369-370, and 371-375, we reproduce as follows:

"Andrew Yeaman, ætat, 19, trumpeter in the Staff-Corps, was embarked on board the ship in the late expedition against Flushing, and had laboured under intermitting fever nearly a month, by which he was much emaciated, and reduced to an alarming state of debility. He had been stationed at Hythe, where I understand intermittents are very prevalent (in consequence, it is believed, of the vicinity of the Royal Military Canal), and by his own account had taken large quantities of bark with wine and opium. Those medicines had never, in the slightest degree, shortened the duration, nor diminished the severity of the paroxysms, and seemed to have produced no other effect than, probably, that of preventing the fever from degenerating into a more continued type, or changing its period of accession. The intermissions, in this case, were most distinct, and unattended with any symptoms indicating disease, except extreme weakness, and a more ghastly paleness of the countenance than I had ever witnessed.

"As I was most anxious to give the cobweb a fair trial, I requested my assistant (Mr. Farkey) to be particularly careful in observing the patient's state and the effects of the remedy, both which he watched with the utmost assiduity; and I feel much pleasure in adding his testimony in behalf of its utility. A quantity of cobweb, not exceeding eight or nine grains, was gathered from the bread-room, and made into pills; one, consisting of five grains, with sufficient mucilage of gum arabic to form it; and the other of the remaining cobweb, prepared in a similar manner. The five grain pill was given on an empty stomach, a little after eight o'clock in the morning (being two hours previous to the expected period of accession), and the other at the usual hour of the paroxysm, which was not felt at all. It may be proper to state, that no other medicine was given with the cobweb; and it will appear, that he did not take nearly the quantity prescribed by Dr. Jackson, as the ship was at sea, and I could not procure more than I have mentioned. The paroxysm never returned; but a slight rigor was felt about the second period from the exhibition of the cobweb, and easily yielded to two grains of opium, followed by bark and sulphuric acid, which completed the cure. As far as I could learn, arsenic had not been resorted to on this occasion.

"Walter Sands, Esq., purser of his Majesty's ship *Camilla*, has been afflicted for many years with a very distressing asthma, which has proved fatal to his father, and called to an early grave two beautiful and accomplished women, his sisters. As the complaint appears to be hereditary, and in this gentleman to be aggravated by mal-formation of the thorax, no remedies gave any permanent relief, nor did change of climate procure any alleviation of symptoms. He has taken, at various times, under the direction of eminent physicians, the foxglove in every form, with all other medicines which have been recommended; and frequently in a kind of despair,

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has resorted to almost every empirical composition from which he could expect advantage; but in vain.

"For a considerable time back he has never been able to lie down in his bed, on account of a sense of suffocation, which he always experiences in a horizontal posture, but is obliged to be supported half-sitting by pillows, and even then is tormented to such a degree by incessant cough, so violent as often to induce vomiting, that he can seldom sleep before two or three o'clock in the morning, and his slumbers are often interrupted. About three weeks ago I was witness to his sufferings, which came on, on board the ship, after he had been dining with me, and I much regretted that I had no cobweb to administer, as I was well aware of the inefficacy of all other medicines in his case. I however mentioned the subject to him, and the following day he collected nearly a scruple of the spider's web, which he swallowed at bedtime, and to his utter astonishment, enjoyed sound and uninterrupted sleep all night; a blessing to which he had been an entire stranger above six years. Since he began the cobweb, he thinks his health is improved; the cough has certainly abated; but he finds much difficulty in procuring a sufficient quantity of the web, and whenever it is omitted the complaint returns."—*James Scott, Surgeon, H. M. S. Euryalus, off Dungeness, Sept. 18, 1809.*

To the discussion Dr. Jackson contributes again as follows:

"That cobweb is capable of stopping the course of intermittents is as well proved as any fact in physic; but it is also true that it acts powerfully in all the other conditions noticed in my paper of May; and I may add, in many others that I omitted to mention. I shall trouble you with only one testimony. In the month of last June, an army physician, who exercises his profession in civil life, and to whom I was little known, accosted me, and took the opportunity of mentioning that he had employed cobweb in a troublesome case, in consequence of what I had said of it in the Medical Journal. The case, he observed, was one of pain, distress, and watchfulness, of unusual obstinacy. The cobweb was ordered faithfully prepared and administered. The effect appeared to have surprised the patient; for he called upon his physician next morning to say that he had not passed a night with so much comfort in six years. The remedy was repeated, and it always gave ease and tranquility, though the patient did not always sleep."—*Robert Jackson, M. D., Castle Eden, Durham, Sept. 19, 1809. From the Medical and Physical Journal, Vol. XXII, pp. 369-370.*

Then came an interval of several decades, in which *Tela Araneæ* was largely neglected, this period of rest being broken, 1865, by the following article in Jones and Scudder's *Materia Medica*, soon followed by another important contribution to the therapeutics of *Tela Araneæ*, by Dr. L. M. Jones, in the *Lancet and Observer*, Cincinnati.

In asthma it is said to allay irritation, tranquilize the system, and act like a charm. In spasmodic complaints of females; in chronic hysteria, and other diseases attended with morbid irritability of the nervous system, it has been advantageously employed. Dr. Webster, of Boston, has found it beneficial in rheumatic affections of the head, asthma, and chronic coughs. He says it produces a pleasant delirium and exhilarating effects resembling the nitrous oxide gas. Dr. Gillespie used it in obstinate intermittents successfully, after other remedies had proved ineffectual. He thinks it more effectual than bark, arsenic, or any other remedy he has employed.

Dose.—Gr. v to vj, in pill; repeat every three or four hours. Dr. Jackson thinks a dose of gr. v produces nearly the same effects as one of gr. xx.—*Jones and Scudder's Materia Medica.*

By L. M. Jones, M. D.:

"Having had some experience with this remedy lately in these troublesome affections, I give it for the consideration of the readers of the *Lancet* and *Observer*.

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"I will give the history of a case of chronic intermittent that came under my care, and the treatment in the same, in order to compare *Tela Araneæ* with other remedies given.

"In December, 1874, I was called to see Nellie P., age 10, suffering with tertian intermittent fever, with which trouble she had been afflicted for over two years. She was of a bilious temperament; very much emaciated icterus hue of skin and conjunctiva; abdomen distended, which in palpation disclosed an enlarged liver and spleen, the latter extended to the crest of the ileum, and could be easily traced through the abdominal parietes; bowels constipated and relaxed alternately, urine very highly colored, with frequent desire to urinate, especially during the febrile stage; cough troublesome, but on examination could not detect disease of the lungs; heart during the paroxysm and subsequent reactionary fever exhibited great irregularity of action; œdema about eyes and face.

"Paroxysms occurred regularly every third day; cold stage lasting from one to two hours; fever from six to eight hours; pulse 120 per minute; skin hot and dry; patient delirious, with nervous twitching of limbs; respiration hurried; fluttering of heart; great thirst and at times sick at stomach; during the high fever, incontinence of urine, which passed in great quantity and of very offensive odor. During the intermission the patient would be up and about the house. It was evident from the length of time that the patient had been afflicted, the deranged condition of the system, and the grave character of the symptoms, that I had one of those perplexing chronic intermittents to treat, which annoy and discourage the patient from the long delayed relief. As several reputable physicians had treated her without success, and ague specifics had been tried in vain, I was fully aware that I had a harassing case on hand, and withal one not devoid of interest.

"Without saying more, I will give the course of treatment that I pursued. I give the prescriptions numbered in the order that they were used in the case, with the exception that they were sometimes refilled with other treatment to suit indications (all of which failed).

"1st. *R* Liq. Potassae arsenitis, dr. iv; *Fld. Ext. taraxaci*, fl. oz. iss; *Syr. simplex*, oz. i. *M. S.* Teaspoonful after each meal and at bedtime.

"2d. *R* Chinoidine, dr. ii; Nitric acid, dilute, dr. i; water, oz. i. *M. S.* Take five to eight drops in water every four hours.

"3d. *R* Quiniae sul., grs. xxx; *Arom. sul. acid*, oz. ss; *Tinct. gelsemium*, oz. i; *Liq. potassae arsenitis*, dr. iii; *Tinct. menth. piperitis*, oz. i. *Syr. simplex*, oz. iii. *M. S.* Teaspoonful every four hours.

"4th. *R* *Ext. eucalyptus globulus*, oz. i; *Ext. glycyrrhiza*, oz. i. *M. S.* Teaspoonful every two hours. Of this she took two bottles in succession.

"5th. *R* *Tinc. iodine*, dr. iii; *Fld. ext. taraxaci*, oz. ii; *Syr. lemon*, dr. v; *Syr. simplex*, oz. i. *M. S.* Teaspoonful after each meal and at bedtime. She took two bottles of this in the course of treatment.

"I gave quinine freely for several days in succession, compound chinoidine pills, composed of chinoidine, sulphate of iron, and piperine; I gave cathartics, including calomel in full and broken doses. This treatment was kept up for several months, alternating from one to another, when I thought necessary to make a change. And yet, I could not break up the paroxysms longer than one week, when they would return, and this intermission would occur at long intervals.

"I then prescribed the following tonics:

"*R* Quiniae sul., gr. xxx; *Mur. tinct. ferri*, dr. iii; *Phos. acid*, dil., oz. ss; *Syr. lemon*, oz. iii. *M. S.* Teaspoonful every four hours.

"She was kept on this prescription for two or three weeks, when her mother came to me and stated that Nellie's chills were getting worse, and that if I could do anything for the child, to do it. What to do next was the question. The decision was—try cobweb.

"I carried the medicine to my patient, and left the following directions: Begin four hours before the expected chill, and give a teaspoonful every hour, until she had taken four doses, then a teaspoonful before each meal and at bedtime, until all was taken. The medicine was given as directed. The anticipated chill came, but was very light compared with the others.

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This, however, was the last chill she had, which has been over four months since.

"Her general appearance has improved, color of skin is clear, the spleen has returned to nearly its natural size, bowels regular, appetite good, in fact the child has so far improved that her friends call her well.

"The patient and relatives did not know what she was taking, and are still ignorant on the subject, so that the mind of the patient had nothing to do in the performance of the cure.

"I gave her the second bottle of the medicine, to be certain that the cure was effectual.

"I have since used the remedy in other cases, with the same success, and would ask that the profession give the remedy a trial in the various intermittents. I will offer no comments on the case that I have cited, or give any theory as to the action of the remedy, but shall leave the reader to his own views. I gave a history of the case, because I considered it an interesting one in several particulars; also was particular in giving the treatment, that a comparison might be made in the remedies used and the results obtained; and that the reader might see for himself that the treatment adopted by the writer was a varied one. I will add in conclusion, that either of the prescriptions given will break up an ordinary case of intermittent fever, chronic or not."—*Lancet and Observer, Cincinnati, April, 1876. Reproduced in Ecl. Med. Jour., May, 1876.*

The paper of Dr. Jones was reproduced in the *Eclectic Medical Journal*, May, 1876, and led to a continued use of *Tela Araneæ* in Eclectic medication, as well as to a closer study of its field of action. The many wanderings of the olden time were finally ignored, and the use of *Tela* was restricted to the conditions named by the following physicians, of extensive practice and experienced observation:

By C. Pierce, M. D.:

"The properties given in the *American Dispensatory* are febrifuge, sedative, and anti-spasmodic. Said to cure intermittents when all other medicines had failed, also recommended in nervous affections, to relieve pain, lessen spasmodic action, and cause sleep without any deleterious narcotic influence.

Professor I. N. Goss says that *Tela Araneæ* is a direct remedy in periodical fever of a hectic type, persistent ague with nervousness; or hysterical complications with a full pulse; oz. ss to aqua iv. dose dr. i. Dr. Skershaw, of St. Louis, who has used this remedy for some time, says that *Tela* has done me excellent service in some old cases of asthma, in which other remedies had failed to do a particle of good, some bronchial coughs too were relieved by it, with surprising rapidity. I find it also of great benefit in persistent sleeplessness, the patient becoming quiet in a short time, and passing into a light, natural sleep, from which he awakes invigorated and refreshed. The whole action of the remedy, as given by the different observers, so nearly corresponds with my own experiences as a whole, that I am induced to give a few cases that I have recorded in my practice.

Case 1. Male, aged 2 years, with a dry, whistling cough, spasmodic in character, resembling whooping cough, with intermittent fever, no perceptible chill. Relieved in one day, and cured in three days.

Case 2. Male, aged 4 years, had terrible, irritable, spasmodic cough. Parents supposed it to be whooping cough; cured with *Tela* in 24 hours. Also the intermittent fever in connection with it.

Mrs. B. had sudden weakness come on her, followed by cold, chilly crampings, numbness of the extremities, when sitting still or lying down; sexual orgasm at night; sudden weakness, and aching pains in pelvis, extending slightly over the whole body, commencing at dark and lasting until midnight; very nervous. *Tela* removed the whole symptoms in 48 hours.

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Mrs. T., age, 43, in her climacteric period, had sudden hot flushes that came over her several times a day, followed by cold sweat, cold extremities, and chilly sensations. Tela relieved her in two days.

Mrs. W., age, 41, attacked with uterine and left ovarian pains; very severe crampings, and remitting pains, with cool, clammy perspiration, cold extremities, previously affected with nocturnal orgasm, sudden nervous affections, and frequent metrorrhagias. A few doses of Tela stopped the pains, and the flow ceased in a week's use of the medicine.

Mrs. D., aged 45, in her climacteric period, had sudden twitching of facial muscles, sexual irritability, nocturnal orgasm, formication and sleeplessness. Prescribed Tela, which relieved her in a few days.

Miss O. had complained of headache for ten days, from occiput to temple on the right, running to forehead, worse at night. Prescribed Tela. Headache removed within 24 hours, and no return.

James W. has for several days had hot flushes to come up suddenly, several times a day, followed by cold sweat, cool extremities, with chilliness. Tela relieved him in six hours.

George N. had weak spells that came on irregularly several times during the day, and regularly at six P. M.; also sudden aching pain in the pelvis, extending more or less over the body, lasting until midnight, with great nervousness. Cured in 30 hours with Tela Araneæ.

George H. had weak spells that came up suddenly with air puffings in his ears; would last half an hour, then were succeeded by cold perspiration, and cold extremities. Was relieved in 24 hours of all symptoms by the use of Tela; continued medicine for three days and no return.

Mrs. F. had typhoid fever, third week, with cold extremities, sore aching pains in spots, worse in left foot and ankle, commencing after dark; in an hour after, followed by a severe, increasing headache in the right side, worse in the last half of the night. At four P. M. muscles of the neck stiff, and severe aching pain in terigo-mastoid, and temporal regions to occiput, cool, moist perspiration, cold extremities. Three drops of tincture relieved her immediately.

Mrs. H. complained of palpitation of the heart, pulse unaltered, cardiac oppression, with cool, moist skin, and cold extremities. Prescribed Tela, with immediate relief.

Miss B., ovaritis, and slight metritis, following abortion, with periodical pains coming on at 3 P. M.; prescribed quinine for the periodicity, which only anticipated the time of the paroxysm that came up at one P. M., with aggravations; then I learned for the first time that previous to her confinement, she had numb spells, and extreme weakness that came on her suddenly, this being among the best symptoms that indicate the use of Tela, which I prescribed. Relieved entirely in two days.

Chas. S., afflicted with sudden, painful palpitation of heart directly followed by smothering, profuse perspiration, and cool extremities; had been often troubled with numbness, removed by massage. Prescribed Tela, with quick relief.

Mrs. J. W. was taken suddenly ill with uterine colic, like extreme abortion pains, sharp and constant, with nausea and rigors like the commencement of the second stage of labor, cold extremities, the os cervix tender to the touch, hard and congested. Five drops of tincture of Tela removed it in five minutes, while other reliable medicines failed.

John D., with pain in heart, came on suddenly with smothering respiration, numbness and cold extremities, pulse small and weak, followed by cool perspiration, and the paroxysms were periodical. Tela relieved him promptly.

Miss Ida P. was troubled with cough when she was lying down, with a tickling behind the sternum, a cold, oppressed feeling in the chest, and numb sensations. It seemed as if much phlegm should be raised, but it could not. Tela relieved all symptoms.

Mr. M. Em., an old toper, reforming under treatment from his last delirium. Commences suddenly at 3 A. M. to have a cool sensation running

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from the small of the back to the end of the penis, with an irresistible desire to pass urine, and from that time until 6 A. M. he passes from one to one and a half gallons of clear, light, straw colored urine, composition very slightly acid, no sugar, no albumen, and rapid decomposition. Tela in three-drop doses every three hours relieved the paroxysmal flow when other medicine of good repute failed.

The specific indications for Tela are these, viz.: masked periodical diseases in hectic, broken down patients. In all diseases that come up suddenly with cool, clammy skin and perspiration, cool extremities; in nocturnal orgasms in either sex. Numbness of the extremities when sitting still or lying down. It relieves spasm of the arterioles, and stimulates capillary circulation. It relieves hyperesthesia of the cerebro-spinal nerves, and the great sympathetic, that depends on debility. It is the greatest heart stimulant in the materia medica, and Lobelia is second only to it.—*Eclectic Medical Journal*, November, 1886.

By Herbert T. Webster, M. D., Oakland, Cal.:

The experience of the writer with this remedy has been very much to its credit. Though it has failed him occasionally—or he has failed to apply it properly—he is convinced that Grauvogl enunciated a lasting benefit to the profession in his exploit with Tela. He has afforded us a central truism, around which much substantial knowledge has been built with clinical experience. Within the past few months, two of the most honored practitioners of our State, Drs. Fearn and Munk, upon separate occasions, have signified their high appreciation of this remedy, in various conditions marked by persistent chilliness.

This symptom appears to be the keynote for its use, though we should dissociate the proposition from the idea that the prolonged chilliness must necessarily belong to an ague, or malarial manifestation. Unless this is done, we are liable to neglect it almost completely; for so many better and more reliable remedies for intermittents are in vogue that we can never expect to win renown with it in this field, though when specifically indicated, it is as applicable in malarial conditions as in any other, according to my experience. The writer, however, has obtained most satisfactory results from it, possibly because he became better acquainted with it in a district where intermittent fever is unknown, unless imported; though it may be mentioned, in passing, that periodicity is rather a significant indication for Tela, though not the leading one. Periodicity, it is to be remembered, does not always indicate malaria. There are exceptions to all rules, and to this rule there are a number.

Whenever a case presents, be it acute or chronic, in which the patient finds himself prone to continual chilliness, unable to get comfortably warm by the aid of proper clothing, apartment and fuel, Tela is the first remedy to be thought of. The demand for it is emphasized if the skin is continually cool and clammy, and if the chilliness is quickly aggravated by dampness. A patient in this condition presents us with what Grauvogl designated a "hydrogenoid constitution," or condition, and this is his specific indication for Tela. We ought, then, to regard the phrases, "cool, clammy skin," and "hydrogenoid condition" as synonymous in their meaning, in this connection, both being specific indications for Tela.

As an illustration of what is meant by the application of Tela to the "hydrogenoid condition" by Grauvogl, one of his cases may be related. A chronic inflammation of the heel, in an old man—probably due to involvement of the petriosteum of the os calcis—resulted in abscess, and later on in a sloughing ulcer. The ulcer was very painful, and arnica was given to relieve the pains, but without much effect. The ulcer continued to deepen, and resort was had, alternately, to silica and calcarea carb., but aggravation still persisted. The patient was constantly chilly, and the pains increased and decreased periodically. Tela was administered, and improvement speedily followed.

Do we understand the *modus operandi* by which Tela corrects this

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clammy chilliness, this hydrogenoid condition, with its accompanying complaint? Hardly. Would it be profitable to speculate upon the matter? Possibly. Does Tela operate through the vasomotor centers, either by relaxing the arterioles or by vivifying the capillaries, and thus improve conditions by imparting a sensation of agreeable general warmth to the hitherto clammy, chilly patient? It acts gradually, so the effects are not to be expected in a minute after administration. A few days of its use, however, will suffice to produce results.

Evidence exists that Tela is a marked neurotic, and that it can hardly be directed exclusively to the vasomotor centers. It is accredited with curing dry, spasmodic cough, stimulating pertussis, and sometimes asthmatic cough; of relieving climacteric flushes, and hot flushes in both sexes, followed by clammy sweat; twitching of the facial muscles, formication, numbness of the extremities, hyperesthesia and insomnia, sexual irritability and nocturnal orgasm, cardiac palpitation with angina, and headaches, all come under its curative influence, when accompanied by the hydrogenoid condition of Grauvogl; especially if periodicity be manifest, and the subject be inclined to neurasthenia.

To illustrate more forcibly the place for Tela, I will quote Dr. O. S. Laws, of Los Angeles:

"There are many cases which need simply that and nothing more. A case came under my care, in 1894, for sundry ailments of the sexual organs, but the most annoying symptom of which she complained was chilliness, and 'cold, clammy sweat,' as she termed it. She was constantly going about, but could not get on wraps enough to prevent the chilliness.

"From what I had read in Dynamical Therapeutics concerning Tela, and from my own use of it in a variety of cases, I prescribed it for her: I put dr. 1 to oz. iv. of water, and she took one teaspoonful of the dilution four times a day. Relief began in a few days, and before the second bottle was gone no extra wraps were needed, and she was benefited in other ways. She has not complained of the chilliness since.

"I use Tela—Specific Medicine, of course—in all cases where numbness is complained of, and the results are so prompt and surprising that it seems like fiction to speak of them."

Resumé.—Tela is specifically indicated in debilitated subjects of neurotic tendency, with cool, clammy skin, protracted sensation of chilliness with or without nervous complication, especially where periodicity is in evidence. Given when the keynote, **chilliness**, long continued, is present, it is liable to remove accompanying neurotic complications, at the same time that it corrects the faulty condition of the circulation.—*Eclectic Medical Journal*, Oct., 1907.

By John Fearn, M. D.:

"Dr. Webster has done the profession a service by his timely article on this remedy in the October Eclectic Medical Journal—a service that I ought to have rendered long ago, but have been prevented by adverse circumstances. To put the matter briefly: A few years ago my health was very much below par, and the chief disease expression was this surface and general coldness. As I walked on the street I saw men in their shirt sleeves, seeming very comfortable. I was warmly dressed and had on an overcoat; but was uncomfortably cold. I had always worn light-weight underwear, but had to change to warmer, without much advantage. In bed the clothes were piled on until the weight was oppressive; but it was the only way I could be comfortable. The old adage says, 'The man who is his own doctor, has a fool for a patient.' I have been my own doctor and family doctor with success. But in this case I failed. I consulted Dr. Webster, and he said, Tela Araneæ is your remedy.' I at once began its use, ten to fifteen drops of Spec. Med. Tela Araneæ in four ounces of water, teaspoonful every three hours. The improvement was remarkable and quick, and it has been permanent.

"Now for the cause of my trouble: The previous winter had been very

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wet, and my duties in my home town were strenuous, in addition to which I had patients in the adjoining towns. To get there I had to cross a marsh, where for some years scavengers had dumped city refuse. The excessive rain seemed to cause a bad stench from this rotting mass, which the breezes from the Pacific Ocean were powerless to neutralize while the rain lasted; and it was this exposure, day after day, which I believe was the cause of my trouble.

"Now, for the *modus operandi* of its action, let me say: The poison affects seriously the nervous system, acting, it seems to me, on the heart through the cardiac plexus, thus weakening the central circulatory organ, and giving rise to a poor peripheral and capillary circulation. Hence blood depravement; hence cold surface. *Tela Araneæ*, by strengthening the heart, improves the condition of the nervous system. Dr. Webster has well pointed out the specific indications for the use of this remedy. Use *Spec. Medicine Tela Araneæ* under these conditions, and you will succeed."—*Eclectic Medical Journal*, Dec., 1907.

After the advent of the Eclectic school of medicine in America (as indicated in the extract from Jones and Scudder's *Materia Medica*, and the articles by Drs. Webster, Fearn, and others, pp. 31-37), came

the restudy of cobweb, or rather, led finally to its more definite as well as restricted application, as shown in its method of employment at the present time. Nor, as shown by the article of Dr. Jones, from the *Lancet and Observer*, (pp. 31-33), has the remedy been altogether neglected by the dominant school.



THERIDIUM TEPIDARIORUM.

(From Blackwell's British Spiders.)

The Spider that spins the web used in making *Specific Medicine Tela Araneæ*.

SPECIFIC MEDICINE TELA ARANEÆ.

The form of the remedial preparation commended by physicians named in this Treatise is the *Specific Medicine*, described herein. This has ever been made from the web of *Theridium tepidariorum* (*see cut*), which builds its web in barns and similar locations. We have no personal experience

with the web of the spider inhabiting cellars, often named in the foregoing pages as being employed by early investigators.

Characteristics.—Two minims of this preparation represent one grain of cobweb. It has a rich straw color, an odor of alcohol, and its evaporation is accompanied by vapors of an offensive, stifling odor. Successive evaporations of 10 Cc. each gave an average residue of 0.058 Gm. (58-100 of one per cent), a result which varies somewhat in different batches. The residue is of a resinous appearance, and is destitute of alkaloids. It is largely soluble in chloroform, less so in

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ammonia, and is nearly insoluble in either water or acid water. 50 Cc. of Specific Medicine Tela Araneæ, diluted with its bulk of water, and distilled to 5 Cc., gave a transparent distillate of an organic odor, free from alkaloids, and neutral to litmus paper. The residue in the distilling flask had a brown-red color, and an offensive odor, reminding one of putrid organic matter. This likewise failed to react with alkaloidal reagents.

No more can the examination of such a substance as Tela Araneæ by ordinary chemical processes be viewed as of any great importance, as concerns its utility in the therapeutic field, than can its hypodermic injection in animals in health portend or limit its therapeutic possibilities in the human being in disease.

Specific Uses.—Dr. J. A. Munk, of Los Angeles, Cal., than whom, possibly, there is no more experienced or carefully qualified observer in therapeutical directions, made the statement in a recent conversation, that he had long used Specific Medicine Tela Araneæ successfully in the treatment of cases where the long continued use of cinchona, quinine, arsenic, and other like remedies had resulted in failure. He stated that patients from the Eastern States sent to his section of California, and afflicted with sleeplessness, nervousness, or malarial attacks unreachable through the usual remedies, responded under the use of Tela Araneæ, which he considers invaluable in such conditions. Where the indications were pronounced, he has found the results of its administration to be surprisingly prompt.

The specific uses of Tela Araneæ, as recorded by Dr. L. A. Perce, of Long Beach, Cal., who also has had great experience in the treating of this class of patients, is condensed into a small compass, as follows:

Uses.—Specific Medicine Tela Araneæ is a sedative acting upon the nervous system and circulation. It is said to have cured intermittent fever when all other remedies had failed. It relieves spasms, lessens pain, and promotes sleep. It has been used in delirium and subsultus of continued fevers, and in hiccough and dry nervous cough, hysteria, periodic headache, asthma, restlessness, insomnia, and muscular spasms. Specific indications as given by Dr. Perce are: "Masked periodical diseases in hectic broken-down patients; in all diseases that come up suddenly with cool, clammy skin, and perspiration, and cool extremities; in nocturnal orgasm in either sex; numbness of the extremities when sitting still or lying down. It relieves spasms of arterioles and stimulates capillary circulation. It relieves hyperesthesia of the cerebro-spinal nerves and the great sympathetic, that depends upon debility. It is the greatest heart stimulant in the materia medica, and lobelia is second only to it.

Dose: Sp. Med. Tela Araneæ gr. v to gr. x in a little water, three times a day. In urgent cases every hour.

PRICES OF SPECIFIC MEDICINE TELA ARANEÆ.

1/4-lb package.....
 1/2-lb package.....
 1-lb package.....

50c each By mail, 50c
 1.00 each " " 1.00
 2.00 each " " 2.00

Spongia.

(SPONGIA USTA).

"The sponges were formerly regarded by many naturalists as belonging to the vegetable kingdom. They are now regarded as compound animals by all, and by many as being even higher than the Protozoa, having close analogies with the Radiates."—*Elements of Zoology, Sanborn.*

Both sponge and its ash have been valued in medicine from a very early date, as shown by the following excerpt from Dioscorides. Translated and condensed by Miss Margaret Stewart, A. M.

"Fresh sponges, and those most free from oils, are helpful for wounds, and to check tumors. With water or vinegar, they bind up (literally, **glue together**) fresh wounds, while, cooked with honey, they join together old wounds. Old sponges are useless. But even these are of value in softening up callouses and separating ulcers that are growing together, if bound upon them, dry, with a linen cloth. Fresh sponges placed upon old ulcers full of corruption dry them up. They also check the flow of blood.

"Burned with vinegar, they are useful in inflammation of the eye: also where there is need of a detergent or astringent. But it is better to tincture the ashes with the remedies to be used for the eye. The ashes of sponges burned with pitch check the flowing of blood."—*Dioscorides, l': 138.*

History. Spongia Usta (Burnt Sponge).—This preparation, known in Dioscorides' day, and in subsequent medical works and Dispensatories as *Spongia Usta*, was once included among the most important of remedial agents. Not only did it occupy a prominent position in the works on domestic medicine, but in authoritative professional publications generally.

The third edition of the *London Pharmacopœia*, 1751, gives explicit directions for its preparation as follows:

Heat the sponge in a covered vessel, till it becomes black, and is easily friable; then reduce it to powder in a glass or marble mortar.

Remark.—The heat here used must be much greater than in the former process; but, however, care should be taken not to burn the sponge till its volatile salt be expelled, for so doing would reduce it to a mere coal; but the volatile salt is so much extricated from the other principles by this operation, that if it be rubbed to powder in a brass or bell-metal mortar, it is very apt to acquire from the vessel a taint, that will offend the stomach. —*From Dispensatory of the Royal College of Physicians, London, 1751 (3d edition).*

This substance crept as a matter of reference into many modern works, but its general use was abandoned very soon after the discovery of *iodine* and the compounds of iodine.

It will be noticed in the above formula that the sponge, after being burned, is to be powdered in a mortar of stone or glass, to pro-

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tect against taint. This feature is more fully explained in *Lewis' Materia Medica*, London, 1768, wherein the foregoing formula, in substance, is given as follows:

Burnt in a close, earthen vessel, till it becomes black and friable, it has been given in doses of a scruple against scrophulous complaints and cutaneous defecations; in which it has sometimes been of service, in virtue, probably, of its saline matter, the proportion of which, after the great reduction which the other matter of the sponge has suffered in the burning, is very large. By virtue of this saline matter also, the preparation, if ground in a brass mortar, corrodes so much of the metal, as to contract a disagreeable taint, and sometimes an **emetic quality**: hence the college expressly orders it to be powdered in a mortar of glass or marble.—*Lewis' Materia Medica*, London, 1768.

It is evident, as experience thus taught, that an emetic compound of copper was produced when a brass mortar was employed.

Coeval with such authorities, as well as others preceding and following, Burnt Sponge maintained its position as a remedial agent. Of this, a quotation from Motherby, giving the uses of Burnt Sponge, together with directions for preparing the drug, is sufficient as an illustration:

Spongia is used in scrophulous disorders, and cutaneous foulnesses, for which end it is reduced, by lightly burning it, to a black powder, which is given in doses from gr. x to xx, two or three times a day; its virtues, which render it useful in these disorders, depend on a volatile, animal, alkaline salt (with which it abounds), and the oil of the **sponge** united.

When **sponge** is cut in small pieces, and freed from the stony matters which are lodged in it, it is burnt in a close, earthen vessel until it is black and friable, and when being powdered in a stone or a glass mortar, it is kept in a close vial for use. The burning should be discontinued as soon as the matter becomes thoroughly black; as the outside of a large quantity will be sufficiently burnt before the middle is much affected; the best method is, to cut it in small pieces, and keep it continually stirring in such a machine as coffee is roasted in.—*Motherby's Medical Dictionary*, London, 1785. (*Second Edition*.)

In 1812, M. Courtois, of Paris, in manufacturing soda, observed that the mother liquors from *kelp* corroded the boilers. In experimenting therewith he discovered the element, iodine. Close following came the fact that sea plants generally, as well as some of the lower forms of animal life of the sea, contained more or less iodine. The new element not only became a fashionable remedy for "scrophulous diseases," but led to the supposition that, as before stated, it alone constituted the remedial portion of Burnt Sponge. Thus, such authorities as *Christison*, in his *Dispensatory*, 1848, asserts:

Sponge contains a trace of combined iodine, and before the discovery of this element and its compounds, was, in the charred state, a remedy in scrofula and goitre. Its use internally, however, is now obsolete.

Indeed, it may perhaps be accepted that the discovery of iodine, and its occurrence in sponge, led the professions of medicine and pharmacy, *theoretically*, to displace Burnt Sponge with iodine and its

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compounds. For example, the *Dictionary of Domestic Medicine*, by Thompson and Smith, 1868, assumes as follows:

Burnt sponge was formerly considered the best remedy in cases of "bronchocele." It is now known that its power of removing that disease depended on the presence of iodine.

Notwithstanding this and other positive assertions concerning the iodine phase of the subject, Burnt Sponge continued, as a therapeutic substance, to occupy authoritative position. For example, the *Pharmacopœia of the United States*, 1836 edition, gave it a position, but not thereafter. The first edition of the *United States Dispensatory*, 1833, commented on it as follows:

The sponge is decomposed, the volatile matters being driven off by the heat, and a black, friable coal remaining, which consists of charcoal mixed with phosphate and carbonate of lime, chloride of sodium, carbonate of soda, and iodine in the state of hydriodate of soda. As the remedial value of burnt sponge depends chiefly upon the presence of iodine, it can not be esteemed good unless it afford purple fumes when acted on by sulphuric acid, assisted by heat. It is said that the preparation is most efficient as a remedy when the sponge is kept on the fire no longer than is necessary to render it friable. The powder is then of a much lighter color. Burnt sponge has been highly commended in goitre, glandular swellings of a scrofulous character, and obstinate cutaneous eruptions. It is most conveniently administered mixed with syrup or honey, in the form of an electuary, with the addition of some aromatic, as powdered cinnamon. The dose is from one to three drachms.—*United States Dispensatory*, Wood and Bache, 1833.

The first edition of the *Eclectic Dispensatory*, King and Newton, 1851, gives the current uses of Burnt Sponge and its compounds, but neglects its assay constituents. In the second edition, 1854, the analysis is added, as follows:

In 1,000 parts of sponge, 343.848 were dissipated by calcination; the remainder consisted of 327.0 parts of carbon and insoluble matters, 112.08 of chloride of sodium, 16.43 of sulphate of lime, 21.422 of iodide of sodium, 7.57 of bromide of magnesium, 103.2 of carbonate of lime, 35.0 of phosphate of lime, 4.73 of magnesia, and 28.72 of oxide of iron. The efficacy of burnt sponge depends principally upon the presence of iodine, and it should always be used when of recent calcination, as it becomes impaired rapidly in consequence of the volatilization of the iodine.—*King's American Eclectic Dispensatory*, 1854.

While Professor King thus accepts the prevailing opinion that Burnt Sponge depends upon iodine and its compounds for its virtues, he wisely qualifies the assertion by stating that it depends "*principally*" upon the presence of iodine, in which direction Professor Wood, in his *Dispensatory of the United States*, above alluded to, 1833, states that the remedial value is due to the presence of iodine, and likewise qualifies his statement by the word *chiefly*.

Owing to the intrusion into therapy of iodine, and to its conspicuity, the natural compound known as *Burnt Sponge* largely disappeared from professional use, excepting in the Homeopathic and Eclectic practice of medicine, where iodine and iodine compounds have

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er been viewed as things in themselves, Burnt Sponge being considered as a compound in itself. For example, *Allen's Inscripta of the Materia Medica*, Vol. 9, devotes eleven or more pages to its therapeutic use, whilst other Homeopathic pharmacopeias, such as that of the *American Institute of Homeopathy*, 1879, and the *United States Homeopathic Pharmacopeia*, 1878, devoted due attention to the preparation of the drug, as well as its dilutions and triturations.

In this connection, it is evident in that in former times more or less questionings arose concerning the possibility of displacing Burnt Sponge by mixtures of charcoal and alkaline substances then known to be present in it. That these attempts thus to brush the remedy of the world out of existence were failures is shown by a statement of the Royal College of Physicians, London, 1809, only two years before the discovery of iodine.

"Burnt sponge appears practically to produce effects which no mixture of the alkali and charcoal does, especially in the removal of bronchocele; and it is therefore retained."

Constituents.—Burnt Sponge contains a large amount of combined iodine, not "a trace" as Christison states. One minim of the Specific Medicine represents one grain of sponge, and (see Characteristics, 43) a fragment of a minim will give a deep blue color with starch test. In addition bromine, phosphorus, sulphur, and other elements in unknown combinations go to make up Burnt Sponge. Whoever reasons concerning the action of compounds made up of such substances as unknown combinations of the elements that theoretically may be formulated into chloride of sodium, calcium sulphate, sodium chloride, magnesium bromide, calcium carbonate, calcium phosphate, magnesium and iron oxides, unknown sulphides, and phosphates reorganized from organic tissue and reconstructed by heat from complex organic bodies, presumes much in asserting that such combinations depend solely for their qualities upon a single substance that may by destructive chemical processes be isolated from the original product. The intermolecular constitution of Burnt Sponge is to-day *unknown*, and the part iodine takes in the therapy of that substance is also *unknown*.

Let us repeat that in our opinion the balanced structure, a complexity in itself, that results in the empirical production of the compound known as Burnt Sponge, can not be molecularly established by any theoretical computation made from a review of the isolated constituents thereof. Consequently, the uses of this preparation by physicians who employ it in contra-distinction to iodine or its compounds, are accepted as logically applying to a structural something, *molecularly unknown*, that must be very different from iodine, or a single iodine compound.

Pharmaceutical Preparations.—The uses of Burnt Sponge are recorded in the foregoing extracts, as well as in a multitude of like publications. The use in Eclectic medicine has been centered mainly in the alcoholic solution known as "Specific Medicine Spongia," in

SPONGIA.

which one pound of Mediterranean natural sponge is burnt according to the old Pharmacopeial directions, and this triturated with alcohol while still hot. The mixture is allowed then to digest until all soluble material is extracted, when it is filtered. This preparation varies somewhat in composition, owing to differences in the sponge, but in general qualities it acts uniformly, as a whole.

Sponges are possessed of some form of mineral skeleton, calcareous, siliceous, and horny. They also enclose foreign substances which aid in giving them stability. These latter substances may be largely separated, mechanically, and magnesium and calcium salts may be dissolved by dilute acids. For the making of pharmaceutical preparations, the natural Mediterranean sponge, only, by this writer, is employed, never sponge that has been acid-cleaned, or chlorine-bleached. Scrap sponge (soft trimmings) is also very inferior, yielding little ash, and that of a poor quality. The whole sponge, carrying the base attachment should be employed, the ash of several bales of such sponges running from 30 to 36 per cent. Such a natural (Mediterranean) *Spongia Usta* may be described as follows:

Spongia Usta varies, not only by reason of the sponge constituents, but through process influences. If the sponge be burned by allowing air to enter the vessel and thus produce a flame, or if the temperature be at first very hot and the process soon ended at a high heat, so as to dissipate all possible volatile constituents, the product is inferior. The combustion process must be a slow, *smothering* manipulation, in which, by a gradually raised heat in a vessel provided with a smoke exit, the product comes mainly to a gray-black or brown color. Throughout this charred, soft, pulverulent texture are to be found silvery specks of mineral matter, and even calcined shell, of considerable size. The odor of the ash reminds one of burnt coal of a marine nature. The taste is strongly saline, accompanied by a persistent, sulphide of hydrogen odor, and a sulphuret (sulphide) after-taste. Treated with sulphuric acid in a covered beaker glass, effervescence follows, and violet fumes arise that change starch paper to a deep blue.

THE SPECIFIC MEDICINE SPONGIA.

Characteristics.—This preparation has a golden yellow color, and the odor of alcohol. Each minim represents one grain of sponge. The evaporation of 10 Cc. leaves about 0.58 per cent. of a crystalline residue, yellowish, and of a saline odor and taste. When in a beaker glass (covered by a watch crystal) sulphuric acid is poured over this residue effervescence follows, the mass assuming a violet color, by liberation of iodine, in places being very dark brown. The beaker becomes next filled with the characteristic violet iodine fumes which change starch paper to blue, or even to brown. On standing, the iodine fumes condense on the cover glass and the cooler parts of the beaker, as minute needle-like crystals. If the sulphuric acid treated mass be exhausted by 10 Cc. chloroform and filtered, a deep violet red solution results, which on spontaneous evaporation yields minute iodine

SPONGIA.

crystals. If upon the contrary the residue be treated with alcohol, the solution is deep yellow, but carries the iodine. Both solutions turn starch paper dark blue, changing to brown. If a few drops of starch paste be spread over the bottom of a porcelain dish, one drop of a mixture of Sp. Med. Spongia and sulphuric acid in its center, will develop a blue color of varying degrees of intensity in accordance with the proportion of the ingredients.

Therapeutical Uses.—In consequence of its neglect by many teachers, as well as by reason of the quickly and yet illogically accepted premise (on the discovery of iodine) that one element, and one only, contributed to its efficacy, the use of *spongia usta* has been restricted mainly to the Homeopathic and Eclectic members of the American medical profession. These physicians also use iodine and its compounds when they are indicated, but they do not neglect "*Spongia*," as is shown by the confidence that experienced practitioners have in its clinical use, and that, too, a hundred years after the discovery of iodine. The Eclectic uses of Spongia, as given by Dr. George M. Hite, who uses the preparation extensively, are tersely expressed, as follows:

Uses.—Spongia gives better results than iodine, in the more chronic forms of goiter. It is useful in chronic pharyngitis with thickening of the mucous membrane. In acute hoarseness from colds, it is the very best remedy of which I know, but it is chiefly as a croup remedy that I have used it. In follicular tonsillitis, Spongia is a most excellent remedy, and combined with other indicated remedies, as aconite, phytolacca, and bichromate of potassium, will relieve in half the time the same prescription would, without the Spongia. It is a fine remedy in laryngitis, with burning, smarting, raw sensations, as it is also in tubercular laryngitis, relieving the teasing cough, and improving the health of the mucous membrane, overcoming the hoarseness, and improving the voice. I have used Spongia for many years, and always with specific results.

Indications.—Croup, with rough, barking, crowing, cough; stridulous respiratory sound during inspiration, with dry cough; loud wheezing respiration, with suffocative fits of coughing; inability to breathe except with the head thrown backward.

Dose.—℞ Sp. Med Spongia.....gtt. x to xxx.
Aqua Dest.̄iv.

M. Sig.—A teaspoonful every fifteen to thirty minutes, to one to two hours, as urgency of symptoms demands.—*Geo. M. Hite, M. D.*

PRICES OF SPECIFIC MEDICINE SPONGIA.

¼-lb package.....	80c. each.	By mail, \$1.02.
½-lb package.....	\$1.50 each.	Not mailable.
1-lb package.....	\$3.00 each.	Not mailable.

Cantharis.- (Cantharides)

"The beetle, *Cantharis vesicatoria* (Linné), De Geer. Thoroughly dried at a temperature not exceeding 40° C. (104° F.)"—U. S. P.

The name *Cantharis*, or *Cantharides*, was applied by ancient Greek writers to many coleopterous insects, their use in medicine dating back to a very early period. Hippocrates speaks of their internal employment in dropsy and amenorrhea, while *Cantharis* is also mentioned in the writings of Dioscorides, Galen, and Pliny. According to Motherby's *New Medical Dictionary*, 1775, the remedy was once called "*French flies*," but inasmuch as the insects were exported largely from Spain as a commercial drug, they became (Motherby) generally known as *Spanish flies*. The systematic study of the living insect is of interest to the entomologist only, but it may be added that several species of the beetle have vesicating qualities, in consequence of which fact they have been known as "Blistering flies."

As is to be expected, the early record of this remedy made of it a favorite with those who believed that the art of curing disease depended upon and rested in the driving out or in the drawing out of "devilish secretions." Consequently, the early records of American medication teem with directions for the production of blisters by means of this energetic product of the insect world.

In the days of the apprenticeship of this writer as a pharmacist, in Cincinnati (four years, beginning 1863), the blister plaster was one of the sheet anchors in "authoritative" medication. The art of cutting and of spreading a *Cantharides* plaster for application to a designated part of the body, as for example, behind the ears, over the chest, along the spine, etc., was then a necessary requirement to pharmaceutical expertness. Whosoever has seen a patient tortured by the excruciating process of a blister can comprehend that the barbarisms practiced upon the American people during the supremacy of this drug overtopped the misery endured by those who suffered in the War of the Revolution. Happily the viciousness of this form of medication no longer prevails in the treatment of any American physician. Obsolete, as is also true of the majority of its barbarous co-laborers of the past, is *Cantharides* Blister, that devilish relic of Mediæval medical "authority."

As an example: About the middle of the last century, in Petersburg, Ky., the writer's brother, N. Ashley Lloyd, then eight years of age, was overcome by the heat while fishing, and carried to his home. Good old Dr. Graves (well named) was called, and as the first

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up to "authoritative" medication he immediately bled the boy. He next applied a Cantharides plaster over the entire back, from the neck down, and administered *blue mass* as a fortifying agent. This treatment, "fortunately" (according to Dr. Graves), "acted promptly and admirably," the back of the child becoming, within the specified time, monstrous blister, the serum possessing (as is its nature) a most potent power of vesicating whatever flesh it touched. This was done, as the writer can testify, by its creeping action upon the sides and limbs of the boy. Near to death's door, struggling for life, the sun-struck child hovered long on the brink of eternity, the question each day being, whether he would be alive the day that followed. Excruciating was his agony. The pain he suffered brought tears to the eyes of all who saw him or heard his cries. The memory of that event, vivid to-day in the mind of the writer, became one of the factors that led to a lifetime of crusading in behalf of kindness to the sick, as opposed to medication wrongs and cruelties, whether instituted by authority or otherwise. Happily between that period and the present the old-time barbarisms, then "authoritative," have largely disappeared.

No longer does the physician, in the case of a sun-struck child, a presumptive girl, or a fever-parched man, apply the Cantharides blister, the tartar-emetic or the Croton oil vesicant, as a "first step" in professional treatment.

Let the description of the foregoing case, that yet vividly appeals to the writer, excuse his dislike of the very word *Cantharides*, which yet brings mental torture. With these remarks, let us pass to the uses of Cantharides in the days of its professional glory, as recited *Coxe's American Dispensatory*.

Medical Use.—Cantharides have a peculiar nauseous smell and an extremely acrid, burning taste. Taken internally, they often occasion a discharge of bloody urine, with exquisite pain; if the dose be considerable, they seem to inflame and ulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fetid and cadaverous; intense pains are felt in the lower belly; the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acids, and occasioning a more plentiful discharge of serum. But even the external application of cantharides is often followed by a strangury, accompanied with thirst and feverish heat.—*Coxe's Amer. Disp.*, 9th ed., 1831, p. 172.

Let us seek now, more directly, the Mediæval uses of the Cantharides blister, as voiced "authoritatively" in the first edition of the *United States Dispensatory*, 1833.

Blisters are calculated to answer numerous indications. Their local effect is attended with a general excitement of the system, which renders them valuable auxiliaries to internal stimulants in low or typhoid conditions of disease; and they may sometimes be safely resorted to with this view when the latter remedies are inadmissible. The powerful impression they make on the system is sufficient in many instances to subvert morbid associations, and thus to allow the re-establishment of healthy action. Hence their application to the cure of remittent and intermittent fevers, in which they often prove effectual, when so employed as to be in full operation at

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the period for the recurrence of the paroxysm. On the principle of revulsion, they prove useful in a vast variety of complaints.

Perhaps the pain produced by blisters may be useful in some cases of nervous excitement or derangement, in which it is desirable to withdraw the attention of the patient from subjects of agitating reflection.—*United States Dispensatory*, 1st ed., 1833, p. 155.

In order, however, that it be not accepted that all physicians and authorities of former times were concerned in the use of this barbarous treatment, we refer to the caution given in Quincy's *Compleat English Dispensatory*, 1749, as follows:

It is not every one who must think himself qualified to meddle with such remedies, which are sure to do good or hurt, according as they are adapted. There are some ill persons who have learn'd to procure abortions by these flies; and to play a great many other unwarrantable tricks with them.—*Compleat English Dispensatory*, 12th ed., 1749, p. 155.

Connected with this is the further caution in the same work, as follows:

The perpetual blister-plasters, which are so much advertised, are nothing else but the common epispastic, drest with an unguent, in which the cantharides are finely powdered and mixed; therefore those who value themselves upon it as a secret, either abuse themselves or other people.—*The Compleat English Dispensatory*, 12th ed., 1749, p. 211.

The fact that serious after-consequences followed the indiscreet use of this vicious vesicant, is further illustrated in Motherby's *New Medical Dictionary*, 1775, as follows:

However used, they are apt to produce a strangury, and inflammation of the urinary passages; to prevent which, when blisters are applied, some rub scruple i. or scruple ii. of camphor, in fine powder, on the surface of the plaister; but this requires also the assistance of nitre, oily drinks, soap pills, &c. Washing the blistered part when dressed, with warm milk, greatly relieves these symptoms.

Sometimes blisters laid to the thighs, or calves of the legs, have produced a gangrene, because a flux of humours is very easily invited to these parts; therefore should not be applied to them when they are cedematous, but rather to the inside of the arms, wrists, nape of the neck or head.—*Motherby, A New Medical Dictionary; or General Repository of Physic*, 1775.

Such as the foregoing led to the attempted antidotal treatment, both of the ill effects of the Cantharides blister and of poisoning therefrom. Perhaps Eberle's *Therapeutics*, 1847, covers this phase of the subject as satisfactorily and as briefly as any, in the face of the fact that there is neither a chemical antidote nor a therapeutic antagonist that will overcome the ill effects of either an excoriating blister or of a destructive stomach disintegration:

The strangury produced by cantharides is best obviated by copious draughts of bland liquids, such as flaxseed tea, gum Arabic water, decoctions of barley, melon seeds, &c.

In cases of poisoning from cantharides, it has been recommended to exhibit large doses of sweet oil: but the experiments of Dr. Pallas and

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Orfila prove that this is an exceedingly improper remedy in accidents of this kind. According to the experiments of the latter, cantharides macerated in cold oil, will, when exhibited to dogs, kill them in a few minutes. This depends on the property which oil possesses of dissolving the active principle of cantharides.*—*Eberle's Materia Medica and Therapeutics*, 6th ed., 1847, pp. 523, 524.

The writer hopes that the foregoing extracts from "authority" of former days will not serve as an inducement to a revived use of this nearly obsolete agent, but rather as a warning, in which the professional reader may, in thankfulness, recognize that such mistaken ideas of therapeutic torture, under the term "professional care," are no longer customary.

PHARMACEUTICAL PREPARATIONS

Physicians of the olden time (see preceding pages) relied largely on the virtues of Cantharides blistering plaster in which the powdered fly, in unctuous mixture, was used in substance. Such a medicament has been official in the various world's Pharmacopeias from an early date. The *tincture* of Cantharides, still official in the Pharmacopeia of the United States, has been thus recognized, and employed both externally and internally. Seldom, however, do we find a prescription therefor at the present date other than in very small amount, insufficient to produce marked local irritation. About fifty years ago a preparation known as Cantharidal Collodion became very popular as a liquid blister. In the enthusiasm of its introduction it became official, and is still a cumberer of the pages of the Pharmacopeia, a lingering relic of mediæval barbarism. In case there be, in the physician's mind, an occasional necessity for a blister, especially if this be in a part of the body where it is difficult to place cantharidal plaster, the Cantharidal Collodion is markedly superior to cruder forms. However, the use of Cantharides in any form, either internal or external, is now practically obsolete in the practice of most physicians.

Specific Medicine Cantharis.—In days gone by, the Eclectic school in medicine used Cantharides very conservatively for specific purposes, and in exceedingly small doses, never in heroic amounts. Specific Medicine Cantharis represents one-half grain of Cantharides to the minim, the dose and uses being summed up as follows by Drs. Ellingwood, Fyfe, and Watkins:

THERAPY.—In small doses this agent is in use in the treatment of cystitis and bladder irritations, accompanied with tenesmus and constant desire. It is serviceable in enuresis when there is relaxation of the bladder walls, and lack of control of the sphincter, especially in that common to relaxed plethoric women, when upon their feet, and when coughing.

It is of some benefit in the treatment of dropsies, especially of those following scarlet fever, and diabetes in its later stages.

It is occasionally beneficial in eczema and acne, when accompanied with uterine or vesical irritation, or with amenorrhea. In small doses it is prescribed in sub-acute or chronic gonorrhea or gleet.

* *Journal de Pharmacie*, November, 1822.

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NOTE.—Powerful vesication is seldom deemed advisable by our physicians as local stimulation by heat or mustard is usually found sufficient. The formation of large blisters or blebs is deprecated, as inducing depression and local pain and general irritation, usually out of all proportion to the benefit derived. The abstraction of the serum from the blood, which contains almost as much albumin as the blood itself, amounts to but little less than actual blood letting. Extreme blistering, even by physicians addicted to most heroic measures, is largely relegated to the past.

When counter irritation, derivation, or local stimulation seems to be needed, we have recourse to local heat, dry or moist, always short of burning, mustard, capsicum, and other agents named in other chapters for their revulsive action, as croton oil, and other oils, thapsia, chloroform, ether and ammonia, confined, and dry cupping.—*Ellingwood's Materia Medica, Therapeutics and Pharmacognosy.*

Cantharis in very small doses exercises a stimulating influence upon the genito-urinary organs, and especially upon the mucous membranes of the bladder and urethra. In these small doses it is promptly corrective when there is burning, stinging pain, strangury or tenesmus of the bladder, but its long-continued use, even in medium doses, may produce strangury, albuminaria or hematuria.

The most dangerous effects of this drug have sometimes been produced by its administration in large doses for the purpose of producing an aphrodisiac result. No less than poisonous doses can possibly produce sexual excitement.—*Fyfe's Specific Diagnosis and Medication.*

The indications for Cantharis, as given by Fyfe and Watkins, are as follows:

INDICATIONS.—Atony of urinary apparatus, especially the bladder; burning, stinging pain, strangury and tenesmus of the neck of the bladder; dysentery, when there is a discharge of mucus streaked with blood, looking like scrapings of the intestines; intense sexual desire; gonorrhœa, when the discharge is purulent and bloody; menses too dark, too early and too profuse.—*Fyfe's Specific Diagnosis and Medication.*

CANTHARIS: Vesical irritation, partial paralysis of the sphincter vesicæ, teasing desire to urinate, dribbling of urine. Three to ten drops of the specific medicine every two hours.—*Watkins' Compendium of the Practice of Medicine.*

The Specific Medicine label carries the following directions and uses:

Cantharis.—A stimulant to the urinary apparatus, especially the bladder. *Dose*—Sp. Med. Cantharis, gtt. iii to x in water, as often as required *Poisonous in overdoses.*

Poison. *Treatment*—Avoid oils. Administer emetics first of all. Freely give demulcents and stimulants. Employ artificial heat externally.

PRICES OF SPECIFIC MEDICINE CANTHARIS.

¼-lb package.....	65c. each.	By mail, 87c.
½-lb package.....	\$1.25 each.	Not available.
1-lb package.....	\$2.50 each.	Not available.

A TREATISE
ON
OPIUM AND ITS COMPOUNDS
DIAPHORETIC POWDER, SUDORIFIC TINCTURE, MILD ZINC
OINTMENT, OPHTHALMIC BALSAM, AND THE ECLECTIC
SUBSTITUTES FOR OPIUM.

The Eclectic Substitutes for Opium and their Uses are by E.
WATERHOUSE, M. D., St. Louis, Missouri.

The Therapeutic Uses of Diaphoretic Powder, Sudorific
Tincture, Mild Zinc Ointment, and Ophthalmic Balsam are by H.
FELTER, M. D., from the American Dispensatory.

The Illustrations are from photographs taken in Asia Minor
by Mr. and Mrs. JOHN URI LLOYD.

Special data concerning Opium in its Oriental home are
properly credited to Professor Thomas H. Norton, the American
Consul in Smyrna, Mr. Alfred A. Keun and Mr. Agop Alpiar,
Smyrna, Turkey.

The Description, Chemistry, Pharmacy and History of all the
substances named are by JOHN URI LLOYD.

**For Descriptions of these Treatises,
see pages 29, 30 and 31.**

Drug Treatise, Number XXII.

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OPIUM.

"The concrete, milky exudation obtained by incising the unripe capsules of *Papaver somniferum*."—U. S. P.

Introduction—To the Agricultural Department of the United States and to the Smithsonian Institution I desire to express my thanks for their special letters of introduction, which enabled me, the winter of 1905 and 1906, to reach, in comfort and safety, many sections of the Orient that might otherwise have been impossible. They brought me also exceptional attentions from both American officials and others, whose care and services I hope to more fully acknowledge in the series of which this opium article is a part.

I desire also to credit, as follows, the gentlemen who supplied the data for the accompanying sketch: First, Professor Thomas H. Norton, the American Consul at Smyrna, Turkey. Second, Mr. Alfred A. Keun, of Alfred A. Keun & Co., to whom Consul Norton introduced me on my arrival in Turkey, and whose firm has, for more than thirty-six years, supplied some of



No. 1.—OPIUM WAREHOUSE.
A. Keun & Co., Smyrna.

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the prominent manufacturers of the world with opium (cut 2.) Mr. Keun and his partner, M. D. C. Savelys, took great pains to give me the information I asked concerning the conduct of the opium business in Smyrna, and added much thereto. They then introduced me to the chemist of the firm, Mr. Agop Alpiar, who has been in the opium industry, as chemist and expert, since 1878. In his well-equipped laboratory I was shown great attention, and I wish to express herewith my surprise and grati-



No. 2.—MR. A. KEUN.

Mr. Alpiar, Chemist, and son of Mr. Keun in background.

fication at the completeness of the laboratory, the carefully-made notes concerning opium and its assay, the extensive library, and the comprehensive and generous manner in which Mr. Keun and Mr. Alpiar contributed the details of a subject in which they are perfectly at home. No question can arise concerning either the authenticity or the responsibility of the information thus extended, and, it may be added, that the implements and specimens furnished me by Mr. Alpiar were those employed for the illustratic

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museum specimens in the Lloyd Library and Museum. The illustrations are from photographs taken by Mrs. Lloyd and myself.

History.*—Opium is one of the Oriental drugs of great antiquity. Theophrastus, the third century before Christ, mentions it. Dioscorides, the same century, distinguishes between opium from the poppy capsule and the extract of the capsule, which he knew to be much less active. Pliny, under the name *Opion*, gives its medicinal use. Celsus, first century, repeatedly mentions it as *Lacrima papaveris*. Dioscorides' writings indicate that, at his date, opium was a drug of Asia Minor. During the Roman Classical period, as well as in the Middle Ages, no other source was known. From Asia Minor opium passed to the Arabs, who introduced it to the Persians, and next, to more Eastern nations. The introduction into India was through the Mohammedans, the earliest mention being by Barbosa, who visited Calicut, the port of export then being Aden, or Cambay. The German traveler, Kämpfer, visited Persia in 1885, and described the various kinds of opium then produced, it being customary to mix it with aromatics, such as nutmeg, cardamom, cinnamon and mace, or saffron, and ambergris; also with the red-coloring matter made of *canna indica* and the seeds of stramonium. In Europe, opium was not, in times gone by, one of the more costly drugs, being cheaper than camphor, rhubarb, or senna.

It may be accepted that the Arabians also introduced opium to the Chinese, who traded with Arabia as early as the ninth century, but later it passed from India to China. The vice of opium smoking began in China after the middle of the seventeenth century, and soon spread like a plague. At present, opium and its alkaloids are used in all civilized countries.

Origin.—Wherever the opium poppy grows, opium of some degree of value is possible. But climate, soil, value of land, and price of labor, limit its area, and control its profitable production by the tedious methods now prevailing. It is an important crop in Asia Minor, Persia, India, China, and triflingly so in

*See also "Pharmacographia," Flückiger & Hanbury, and other standard works, from which these historical notes have been collated.

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In Europe and North America, attempts to produce it failed, partly because of climatic conditions, but mainly by reason of labor expense.*



—CAMEL TRAIN. SMYRNA.

The land known as Asia Minor is its home, now as in the past, the principal port of export being Smyrna. Hence, in making our study of the drug we sought this city, and in its vicinity made our research (cut 3).

The Opium Poppy.—

Everywhere about Smyrna, in the months of April and May, a beautiful, scarlet, single poppy prevails as a

It accompanies all crops, blooms along the roadside, and itself year by year. This very conspicuous variety of

is also abundant about adjacent countries found in Greece, , and the Mediterranean islands generally. However, is *not* the poppy, as many travelers accept. No opium is found wild in these , nor is it cultivated than five hours by rail myrna (cut 4). Nor is produced in the immediate vicinity of Smyrna. The opium poppy (*Pasomniferum*) blooms April and May. The varies from a light



No. 4.—IN THE OPIUM COUNTRY.
SARDIS.

* "Chemist and Druggist" Supplement, April 14, 1906, p. 59, for article primitive attempt to grow opium in Australia.

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pink to purplish pink, the specimen photographed by me May 3d, 1906, being in full bloom, five inches in diameter, and of a pronounced, narcotic odor (cuts 5 and 6.) This is a typical poppy blossom, grown in its home land, the capsule, at this stage, being half an inch in diameter.

Cultivation.—The soil that profitably produces opium is a somewhat silicious clay. The preferable locations are rich, valley lands, plains not too wet, and the foot-slopes of the mountains. The plant thrives at various altitudes, even high mountain table-lands and mountain valleys proving admirable locations.

The soil is roughly plowed (cut 7) in the early fall, about August, in the lower warm sections, and October in more elevated locations; and it is essential that it be abundantly manured with barnyard manure. The seed are from poppy capsules of the previous year, and range in color from bluish to yellow and white, the bluish color being preferred. Before sowing, the seeds are mixed with sand, as is the method with grass and other small seed, and it is then sown broadcast at the proper season over the well-smoothed field in October, if it be possible at that date to get the ground in condition. About thirteen ounces of seed are taken to the acre.

Germination results in accordance with the altitude and the moisture of the season. In about thirty days the plants are an inch high. November to December, snow falls in the opium section, covering plants. Should it now melt and a freeze succeed, the crop is ruined. Early frosts, preceding snow, are also very injurious, because the poppy plant is very delicate when young. If the snow falls early and remains all winter, the



No. 5.—OPIUM POPPY.

OPIUM.

plants reach perfection. Thus, an ideal opium climate is such as best fits the wheat crops.

In the spring, after the snow melts and the plants have attained about six inches in height, the fields are thoroughly weeded and the poppy plants thinned until they stand about two feet apart. When they are evenly distributed over the field in such condition, the crop is most promising. However, should



No. 6.—OPIUM POPPIES AND CAPSULES.

the winter frosts have "winter-killed" the crop in patches, the thin parts are replowed and spring-sown. If it be injured as a whole, the entire field is replowed and spring-planted, or a new location for the crop is selected. This replanting takes place from January to March, according to locality. Spring sowing is deprecated, both by reason of the extra labor and because the resultant opium is of inferior quality and the yield less in

OPIUM.

amount. Opium culture, in one location for four or five successive years, demands that the ground be given a rest of at least a year.

The Crop.—The poppy blossoms in April and May. The capsule matures from June to July, in accordance with locality and season. The elevated interior districts are latest, but yield the best opium, that produced in



No. 7.—PLOW BOY IN OPIUM CULTURE.

damp or wet lowlands being poorest. When the plant attains a height of four to five feet and the capsules begin to turn successively from bluish-green to yellowish, or slightly



No. 8.—POPPY FIELD.

golden, they soften to the touch. This is the all-important or critical period in the life of this exacting crop, for, at this time, neglect of even four hours, is sufficient to materially decrease the

returns. Now the patience of that most patient of all people, the Turks, is taxed to the utmost. The whole population, men, women, boys, and girls, turn to the harvest (cut 8).*

*Owing to the fact that I took no photograph of the Turkish opium fields this, from Egypt, was utilized.

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ally the workers pass through the fields, and artfully, with a knife that carries a fine saw-edge, incise the successively heads. The incision is made horizontal to the earth,



FIG. 10. — OPIUM CAPSULE.
Showing incising cut.

around the circumference of the capsule, encircling it to within half an inch of the starting point. About Harput, and perhaps in other districts, a knife with three blades is employed. Here the native cuts several short, diagonal gashes just above the belly of the capsule. This incising act is a very delicate operation, and demands both care and expertness. The aim is to pierce only the pericarp, that carries the lactiferous cells, for should the incision

reach the interior of the poppy capsule, the exuding juice would be lost.

In a climate that is fair, the location elevated, the wind north and cool, the soil dry, the incisions are made in the evening, the exuded juice being scraped off the next morning. Should dew fall or rain come, there is no yield whatever.

In a low ground, where dew prevails, the incisions are made early in the morning, the juice being scraped from eleven o'clock that morning until sunset.

Incising.—The blade of the incising knife is about two inches long, one edge beveled, with small saw-teeth, the other edge straight, egg-shaped, and pointed. This knife is called *Dgeezquee*; (pronounced *geez-quee*). The saw-edge is used to incise the capsule, the opposing edge to scrape from the capsule the exuded juice. As the juice accumulates, the natives, from time to time, take it to a wooden tray (cut 12), about six inches long and three inches deep, a small steel blade inserted into the part next to the incision used for the scraping purpose (cut 12 A). The natives call this an *Alquee*.



FIG. 11. — OPIUM CAPSULE.
Showing three-blade incising cut.

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No. 11.—KNIFE FOR
SCARRING CAP-
SULE. (*Dgeezguee.*)

The freshly-scraped juice (tears) is of a soft, pillular consistence, averaging from forty to forty-five per cent moisture. The crop of tears (scrapings), as it accumulates in sufficient bulk, is transferred from the *Alguee* to an earthen vessel or tray, but is sometimes dumped on the sand or earth. It is then kneaded by the hands to a uniform consistence, after which it is made into balls of various sizes. These are enclosed in a dress of poppy leaves, placed on trays, and slowly cured in the shade, in a cool location. After they reach the proper consistence, the balls, familiar as Opium of Commerce, are packed in baskets lined with linen, an abundance of mixed dried seeds and leaves of wild rumex being used to keep them apart, and to absorb the moisture. The opium in these baskets averages from one hundred and sixty to one hundred and eighty pounds. The baskets are of wicker, of uniform size and shape, about three feet deep and one and one-half feet in diameter. They are nearly cylindrical, and are lined with linen (cut 13).

To make the opium crop a possible success, the very richest land is necessary, and it must be fortified by constant manuring. The climate must be nearly rainless in the summer, and yet, throughout a necessarily mild winter, snow must



No. 12.—TRAY FOR COL-
LECTING GUM.
(*Alguee.*)

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continually blanket the earth. The agriculturist must be ever watchful, ever patient, and must expect disappointments, even total loss, at the last moment. Unfavorable drouths in the spring, destructive insects, winter freezes, or harmful rain during the collecting season may result in great loss or total failure. There must be an abundance of labor procurable at the critical period, at from thirty to fifty cents per day of fourteen hours.



No. 13.—OPIUM MERCHANT AND ORIGINAL
BALES OF OPIUM.

All these conditions favor the Turkish opium section. No other people can be more frugal, more patient, more resigned to adversity or more ready, when failure occurs, to begin over again than are the Turks of to-day, and the preceding generations of Turks (cut 14, scene in Turkey).

An acre of good soil, under favorable conditions as concerns climate and care, will yield from twenty-five to forty-five pounds of opium. It is calculated

that to produce this requires 21,000 poppy plants, averaging six capsules each.* In addition to the opium, about 1,000 pounds of poppy seeds are obtained, capable of producing 400 pounds of oil at five to eleven cents, which is an important article of food with the frugal agricultural classes of the interior, beyond the zone that produces the olive tree, which does not thrive farther than fifty miles from the sea. The time of collection Turkey in Asia, for two and one-half months, although

* the book of Mr. Alptar, who made the calculation in the

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but a few days for harvesting are possible in any one location. The industrious peasant, in the harvest period, working from daylight to dark, earns from fifteen to forty-five cents daily. If the crop be a success, the land-owner reaps a moderate return for a whole year's care and labor devoted to the most exacting of all crops, not excepting tobacco. If the crop be a failure, and it may become nearly a total loss by rain at the last moment or by frost at the critical point, in the fall or spring, the patient Turk says, "Inshâllah Kissmet yarren guëlr"—"With the will of God, good luck may come to-morrow."

Characteristics.—

Fresh, prime Smyrna opium has a soft consistence, and in color is dark yellowish, or brown. It breaks with a tough pull and an uneven fracture. The crust is much darker than the central part, and much drier. The structure of the ordinary quality is not smooth, owing to the presence of foreign substances, such as the scrapings of the capsule and gum of unequal consistence. The odor of prime opium is strongly and (to me) pleasantly narcotic, unmarked by any fruity flavor. The taste is bitter and peculiar. The morphine value of prime selected Smyrna opium averages (Alpiar) from ten per cent to thirteen and one-half per cent.

Adulterations.—In former years, before opium was valued by morphine percentage, some of the natives or dealers were given to profitable sophistication, the aim being to deceive the inspectors by the use of extraneous substances that increased the weight of the product, without disturbing the odor or the color and consistence. This habit lingers somewhat yet, although



No. 14.—TURK IN OPIUM COUNTRY.

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the growers and manipulators are fast learning that sophisticating processes involve themselves in financial loss. About ten per cent of the opium that enters Smyrna is now (1906) more or less adulterated, the *low* grades running from three per cent to six per cent morphine. Among the sophisticants may be named salep, sand, crushed raisins, apricot pulp, prunes, yolk of egg, excessive scrapings from poppy capsules, shot or lead, iron, flour, extract of poppy heads, gum arabic, yellow beeswax, and powdered cummin seed. This last is very likely to deceive by its color. The sand is not alone mixed with the gum during the kneading process, but may contaminate it naturally, if the opium is spread on the ground during its collection. Nor is the presence of sand a sure indication of inferiority. The sand shown in our museum specimen, weighing ten ounces, came from only twenty-three pounds of choice, high-grade opium, assayed by Mr. Alpiar.

Low-grade opium is now prohibited from the American and the English markets. In America, a grade less than nine per cent morphine is prohibited. It is said that this excluded product, at a discount of twenty per cent to thirty per cent below its value, finds its chief market in Italy.

Buying Opium.—Formerly, opium came from the interior of Turkey by camel caravan (see cut 3, Camel Train in Smyrna), but a railway now extends into the poppy region. The juice, as has been said, is scraped in June, July, and August, the opium being cured, packed, and marketed as soon thereafter as possible. The producer sells it to commission merchants, who in turn supply the exporter as fast as a sufficient amount is accumulated.

Inspecting.—The inspector is a man of experience in opium, and may be one of a line of family experts. The expert now before me, Mr. Jacob Gabbai (cut 15), is the grandson of a professional inspector, and is assisted by his brother and his son. The broken opium knife in our museum (cut 16) was his grandfather's, and has been used in opium testing for over thirty years. Mr. Gabbai has filled the place of inspector thirty-six years, and has averaged 3,500 baskets yearly. He sits cross-legged on a mat on the floor. The purchaser and the seller hav-

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ing agreed to abide by his decision, the opium baskets are successively dumped before him. Rapidly he cuts a deep circular cone from each ball, inspecting the interior by both sight and smell, rejecting those he considers inferior or adulterated. From some baskets most of the opium is condemned; from others, only a few balls are rejected. During the time I witnessed one of the inspections, the seller protested but once against the decision. But the inspector refused to reconsider, stating that the ball was adulterated with prunes.

In some cases, when opium comes rapidly to market, several inspectors work simultaneously (cut 17). It is remarkable how



NO. 15.—OPIUM INSPECTOR. MR. JACOB GABBAL.

quickly and expertly they handle a basket of 180 pounds; how, with a single gash, the sense of smell and an eye touch, these men pre-judge a ball that, to an inexperienced person, presents no fault. The inspector is paid one-half of one per cent the value of the opium he handles.

Mr. Alpiar states that invariably the rejected opium runs

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down to six or even four per cent morphine. This, considering the remarkable rapidity of the inspector's work, and the fact that it is the expertness of empirical experience only, is, *to me*, inexplicable. In no other direction have I been confronted with the scientific result that comes by the empirical perfection of experience and the educating of the senses.

Assaying.—The accepted balls pass immediately into the hands of the purchaser, who now cuts each lump into halves, and from the *interior** of each takes a piece the size of an



NO. 16.—OPIUM KNIFE
USED BY INSPECTOR.

English walnut. One hundred baskets furnish about one hundred pounds of these samples, which are at once weighed and thoroughly incorporated into a uniform mass, in a tightly-closed kneading machine, which prevents any evaporation of moisture. One hundred grammes are then *immediately* assayed to crystalline *white morphine*.

For this purpose, the firm of Alfred A. Keun & Co. have a complete laboratory, well equipped with the most modern apparatus, including stills, vacuum apparatus, machinery, and delicate glassware and reagents. The chemist, Mr. Agop Alpiar (cut 18), has been engaged in this special work fifteen years, and,

aside from his great personal experience, he keeps abreast of the world's literature on opium and alkaloidal assay methods by means of a voluminous special library. In this connection it may be of interest to state that he obtains 1.80 per cent more (white, crystallized) morphine than the assay process of the U. S. P. indicates.†

*Dr. Squibb took his samples from the crust *inward*, sampling every fifth ball, if large; every tenth ball, if small. In Smyrna *every* ball is inspected.

†Mr. Alpiar considers this mostly due to loss in the mother-liquors, where such small amounts, as the U. S. P. directs, are employed. This variation in assay by means of quantity influence is not exceptional, when assay processes employing minute portions are contrasted with successively connected batches on a manufacturing scale. It thus becomes possible to profitably utilize mother-liquors that, on a small scale, are thrown away.

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Packing the Opium for Export.—In order to prevent mould, fermentation, and subsequent structural changes that are liable to occur in the moist drug in protracted sea voyage and storage for morphine makers, the drug is allowed to lose its excess of moisture before being packed in tin-lined cases, each holding from 130 to 170 pounds. This does not apply to commercial opium for general use, although, since the pharmacopœial



No. 17.—INSPECTING OPIUM. SMYRNA.

standards are now based on powdered opium, it is likely the crude drug will pass from pharmacy.

Composition.—Blowan's Chemistry accepts that Smyrna opium averages as follows: Gum, 26.2 per cent; caoutchouc, 6.0; resin, 3.6; oily matters, 2.2; meconic acid, 5.0; morphine, 10.8; narcotine, 6.8; narceine, 6.7; meconine, 0.8; codeine, 0.7; coloring matter and extractives, 19.1; water, 9.9. The record of Mr. Alpiar gives good, green opium an average of 10 per cent to 13½ per cent morphine.

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Summary.—Opium culture, by prevailing methods, is most exacting, and the yield uncertain. The foregoing treatise illustrates the trying nature of the culture of the poppy, whilst the uncertainty of the crop can be no better shown than to tabulate the yearly yield for a decade:

Opium Crops in the Turkish Empire.

(In "Couffes," or baskets, of about 170 pounds each.)

Year.	No. of Couffes.	Year.	No. of Couffes.
1895	8,000	1901	6,500
1896	4,500	1902	11,000
1897	8,000	1903	4,000
1898	3,500	1904	10,000
1899	6,500	1905	3,500
1900	8,500		

Shipments of Opium from Smyrna to the United States.

1905	339,903.2 lbs.	1900	219,800.0 lbs.
1904	364,252.0 "	1899	201,600.0 "
1903	270,222.4 "	1898	76,440.0 "
1902	186,454.8 "	1897	599,200.0 "
1901	462,977.2 "	1896	165,760.0 "

Opium Consumers.—Need it be said that the consumers of opium, either as medicine, as a narcotic drug, or for smoking, embrace all nations? Opium has its friends and its slaves in



No. 18.—MR. ALPIAR, OPIUM CHEMIST. (Central figure.)

Europe, Asia, Africa, and America alike. It has mastered its millions in India and China. But neither opium nor any preparation of opium is used in any way by the Turks who pro-

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duce it. Absolute abstainers are they; nor does any alcoholic beverage ever pass their lips. I can not forget the exclamations of those about me when, after breaking a piece of exceptionally choice opium, I touched my finger to my tongue. Their movements to prevent the action and their protests were both emphatic and expressive.

However, in exceptional cases, an infusion of poppy capsules (not opium) is used to moisten the tobacco smoked by Turks in their nargilehs. This gives the tobacco a dark color, but it is said to be a great favorite with the few who employ it for smoking. Some years ago, a tobacconist from abroad learned this fact in Smyrna, and introduced to Europeans a brand of tobacco thus prepared. Now, this brand is in great demand, and is said to hold its users with a grasp that can not be shaken.* The amount of opium alkaloid thus conveyed to the tobacco is too small to be easily detected in the presence of the *abundant nicotine* and other tobacco alkaloids with which it is associated, if, indeed, it is subject to determination.

"Honey Mad."—In the flowering season of the opium poppy, bees make a honey possessed of narcotic qualities, such honey being known as "*Mad Honey*." Partakers of it wander aimlessly about, talk incoherently, and appear crazy. It is not a soporific, seemingly having quite different qualities from morphine. That the affection is not serious, however, is evidenced by the fact that, in Harput, Turkey, when Mrs. Thomas H. Norton, wife of the American consul, inquired what possessed a man under its influence, the reply was to the effect that he was only "*Honey Mad*."

PHARMACEUTICAL PREPARATIONS.

The preparations of opium, pharmaceutical and otherwise, are numberless. The Pharmacopoeias of the world, in all languages and of all countries, have all, from the earliest date, recognized this drug and its preparations. They have also introduced it into so many compounds as to make it impossible

*This information was given me by Dr. Chasseaud, of Smyrna. For obvious reasons, I omit the name of the brand of tobacco.

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even to attempt to mention them by title. In addition, the proprietary remedies introduced under now popular titles, carrying opium or a preparation of opium, such as Godfrey's Cordial, and others of a similar nature, are legion. Such as these have been largely established in domestic medicine under the mystery of the marvelous, as the enticement of secrecy so readily permits, and they, too, have been tolerated by the physicians of the past, and too often by those of the present. Indeed, many of the opium compounds of other days were introduced by authority of the medical profession, from which they crept into domestic use. Of the remedies so popularized, two linger yet as the most used of the official opium compounds in the Pharmacopoeia, one of these being laudanum, and the other paregoric. These, with Deoderized Tincture of Opium, constitute the liquid Pharmacopoeial preparations of opium.

The alkaloids of opium have been subjected to a course of chemical investigation second to the alkaloids of no other drug, not excepting cinchona. To attempt to even summarize the story of the opium alkaloids, would be to write a volume. Be it enough to state that one of these, morphine, stands on record as the first discovered organic substance of alkaline reaction, and hence, by reason of that fact, was named alkaloid. It is the pioneer of the list, to which, in the century that has followed its discovery, have been added a few other plant alkaloids that are useful. Among the opium alkaloids, two only stand as therapeutically established in the practice of physicians generally, one being morphine, and the other codeine. We shall not consume time on the chemistry of these two alkaloids, but refer the reader to the many works connected with that problem. Nor shall we introduce the therapy side of these substances, because of the fact that they are so well recorded in all standard works. Let us, then, pass to the preparations of the Eclectic school, carrying opium or its compounds.

In referring to the article of Dr Waterhouse, page 24, the fact that this drug has ever been excluded as much as possible from the practice of Eclectic physicians, is made apparent. In this connection we will add that in the early days of the Eclectic school, an attempt was made to modify the methods of the

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heroic in medicine, both as to dosage and viciousness of drugs as heired from the mediaeval authorities of Europe, whose writings and methods established authoritative medicine in early America. Among the substances that the Eclectic physician considered as being harmful when injudiciously employed, were opium and its preparations. Their aim, therefore, was to displace it when possible with kindlier remedies, and only when necessary to utilize it, and even then in severe moderation, or in connection with a course of treatment that could not lead to the establishment of the opium habit. This phase of the work of the early Eclectics, and their ideals in such directions as these, was not fully comprehended by those who resisted their attempts at such now generally recognized needed reforms. But it is pleasant to appreciate that at the present time a kindlier feeling pervades the professions generally, and that among physicians as a rule the ambitions of the Eclectic of seventy-five years ago are now very kindly received, and their methods, as concerns the abuse of this narcotic, perhaps with the majority of thoughtful physicians have been adopted. Consequently, for this treatise of Dr. Waterhouse we bespeak a kindly reception from thousands of physicians from other schools, who appreciate the helpfulness of such a paper, and whose aims and ambitions accord exactly with the ambitions of those we have mentioned. Such as these will also study with great interest, satisfaction, and in many instances with profit, the Eclectic substitutes for opium and the methods of their use as recorded in Dr. Waterhouse's article, and will probably employ these remedies more or less in their practice, and likewise utilize, or at least investigate, the qualities and reasons for establishing the Eclectic pharmaceutical preparations to be soon named, of which opium forms a part. Only four Eclectic remedies contain opium, or its alkaloid, morphine, namely, sudorific tincture, diaphoretic powder, ophthalmic balsam, and mild zinc ointment. These were evolved in the early days of American medicine, contain very small amounts of opium or its alkaloids, and they have all stood as useful remedies when necessity demanded, in the practice of the school, and not likely to induce the opium habit. Indeed, be it said that no record has ever

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been made of the opium habit having been induced in any one by their employment, nor has any one, to our knowledge, ever used one of these remedies as an opium substitute for opium.

DIAPHORETIC POWDER.

Compound Powder of Ipecac and Opium.

This preparation contains opium, camphor, ipecac, and bitartrate of potassium. It carries nineteen grains of opium to each ounce, paralleling, in some directions, the popular Dover's Powder of olden times. But it possesses great advantages over that substance, in that the camphor and bitartrate of potassium modify the opium action, both as regards its influence as a narcotic, and on the secretions. The uses and doses, as recorded by Professor Felter in the American Dispensatory, are as follows:

"This powder is an excellent anodyne and diaphoretic, and is, perhaps, superior to any other preparation in its diaphoretic effects upon the system. It is of great efficiency in all febrile and inflammatory diseases, diarrhea, dysentery, cholera morbus, gout, rheumatism, after-pains, all cases of nervous prostration or excitement, and whenever an anodyne conjoined with a diaphoretic is indicated. It favors perspiration without augmenting the heat of the body. In preparing it, practitioners vary the original formula according to their favorite views; thus some omit the cream of tartar, and substitute nitrate of potassium or bicarbonate of sodium, while others omit the opium, substituting in its place lactucarium, or twice the quantity of oleoresin of cypripedium, rendered dry by the addition of magnesia.

"**Dose**—3 to 5 grains, in every 3 or 4 hours, in febrile or inflammatory diseases, and in some cases, 10 grains, 3 times a day. Its action may be materially promoted as a diaphoretic by warm drinks, such as catnip, balm, or sage tea, lemonade, etc., which, however, should not be given immediately after the administration of the powder, lest vomiting be provoked. In rheumatism, pneumonia, cerebral affections, hepatic diseases, etc., it is frequently combined with small doses of resin of popdophyllum."

In some instances, where physicians were fanatically opposed to the use of opium, even in their professional practice, as has been stated, lactucarium or cypripedium were substituted in the formula for the opium, but as is well known, the preparation has so little of the action of the opium, which is so modified by its associates as to be unobjectionable, even to those who aim to practice medicine successfully without that drug.

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SUDORIFIC TINCTURE.

Compound Tincture of *Serpentaria*.

This preparation is composed of *serpentaria*, *ipecac*, saffron, camphor, and opium, from which a tincture is made carrying the virtues of ten grains of opium to each fluid ounce. Where physicians are opposed to the use of opium, four times the amount of *cypripedium* are introduced instead of the opium, but this makes a very unpleasant compound. Our remarks concerning the Eclectic diaphoretic powder, and escaping the enslaving qualities of opium, together with overcoming its untoward action on the secretions, may be applied to this preparation, which to many physicians accustomed to the employment of ordinary opium preparations, will be a revelation. From the American Dispensatory we reproduce its uses, as established these many decades ago, and to which nothing has since been added, nor, seemingly, is anything necessary.

"Action, Medical Uses, and Dosage.—This is a powerful sudorific, and is used in all cases where a copious perspiration is required, or where it is desired to lessen pain, allay nervous excitability, procure sleep, and keep up a determination to the skin. One teaspoonful in some warm herb tea, repeated every hour, aided by warm infusions and bathing the feet, will soon produce copious diaphoresis. In pleurisy, a much larger dose may be given. In other cases, it may be given in doses of from 10 to 60 drops. It will be found beneficial in after-pains, painful dysmenorrhea, amenorrhea, from recent exposure to cold, cramp in the stomach, hysteria, in fevers and inflammatory diseases, etc."

MILD ZINC OINTMENT.

This preparation contains two grains of morphine sulphate to the ounce. It is an improved form of the Zinc Oxide Ointment, and was devised by Professor R. S. Newton, M. D. It contains white wax, zinc oxide, morphine sulphate, olive oil, spermaceti, benzoic acid, and ottar of rose. It is very popular, and is a surprisingly excellent remedy, its application being followed by unexpected relief.

"Use.—A soothing anodyne application for burns, scalds, ulcers, abrasions, etc., or wherever such a medicament is indicated."

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OPHTHALMIC BALSAM.

This preparation resembles the foregoing, as concerns its composition, with the addition of white precipitate, or ammoniated chloride of mercury. It contains, however, but one grain of morphine sulphate to the ounce. This preparation is similar to the very popular remedy of olden times introduced under the name of "Pettit's Ophthalmic Balsam, or Eye Salve," and in affections of the eye, as well as elsewhere, where a soothing application is desired, is remarkably beneficial. The writer has experienced its kindly touch where other remedies were inadequate, and has seen its almost miraculous effects in cases of inflammation or irritation of the eyes that had resisted other treatment. It is one of the preparations of the olden time that should not be neglected in modern therapy, and one that to physicians unacquainted with it should be at once placed in their list of remedies. In this connection we call attention to the fact that one of its constituents is **white precipitate**, a mercury compound, which fact will disabuse the minds of some people of the erroneous opinion that the Eclectic profession ostracise mercury from their practice. Ophthalmic Balsam has held its place in the Eclectic Dispensatory from its first issue, and has been commended by Eclectic authorities for more than half a century, which would indicate that although in many instances individuals have fanatically resisted the use of the mercurials in medicine, as they have all opium compounds, the rank and file, and the great majority of the profession, have conservatively tolerated them and have even advocated the use, but not the abuse, of such as these.

OPIUM, ECLECTIC SUBSTITUTES.

THERAPEUTICS AND THE ECLECTIC SUBSTITUTES FOR OPIUM.

BY PROFESSOR E. R. WATERHOUSE, M. D.

While Eclectic physicians use opium to a very limited extent, the drug has been for years a prominent factor with the Regular school of medicine, probably ranking first in their list of remedies. When we remember how baneful are its effects, how steadfastly it holds its victims in its clutches, how easily the pernicious opium habit is contracted, and how frequently it may be traced back to the injudicious employment of the drug by a physician, the question arises whether the beneficial effects of opium are not more than counterbalanced by its negative influences, or whether it has not been more of a curse than a blessing to mankind.

The most liberal and charitable view of the subject prompts us in advising physicians to use as little of this drug as possible, keeping always well in mind the many other remedies that are capable of doing its vaunted therapeutic work, and which leave behind them no trail of woe. Yet, after all is said, with two classes of physicians, the one too indolent to do much thinking, and the other minus the capacity for thinking upon the right lines, opium will continue to stand as the chief pain reliever.

The action of opium may be classed as stimulant, narcotic, anodyne, sedative and diaphoretic. The first effect of the administration of a medicinal dose of opium is to stimulate and increase the activity of every function of the body. It relieves pain, quiets nerve excitement, and causes an increased action of the skin, while in large doses it is a narcotic poison, this latter effect being frequently brought about by doses of from three to ten grains of the crude product. The safe dose for an adult is about one grain of opium, one-fourth of a grain of morphine, one grain of codeine, twenty drops of tincture opium, or one drachm of the camphorated tincture of opium. Yet, when the opium habit is fully developed, astonishingly large doses may be taken without any alarming results. The gastric juices of herbivorous animals are said to destroy a large per cent of

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opium when taken into the stomach, which accounts for the large doses that they can tolerate.

Provided we can find nothing better, opium may be administered where there is a soft open pulse, and a moist skin, but it is contra-indicated where the skin is hot and dry, or where the eyes are bright, with contracted pupils. In this latter condition, Specific Medicine gelsemium is especially indicated. Great care should always be observed in giving opium to the aged and to young children, the proportion of other drugs as given for these cases not holding good as regards opium, of which even a very small dose may kill a baby.

Opium always destroys the appetite, but increases the thirst, locks up the bowels, and diminishes the secretions from the kidneys. This action of opium in retarding all the secretions of the body, save those of the skin, often causes irreparable damage in diseases that we may class as caused by retentions, invasions, and infections, as here opium locks the doors that, therapeutically, we wish to be kept open.

But four Eclectic remedies contain opium, namely, Sudorific Tincture, Diaphoretic Powder, and Ophthalmic Balsam, with its relative, Mild Zinc Ointment. The proportion of opium in each of these is very small, and, not one of these remedies is employed for its opium constituent or has ever been accused of having occasioned the opium habit. The Sudorific Tincture carries ten grains of opium to the ounce. It also contains serpentaria, camphor, saffron, and alcohol. It is a powerful sudorific, where profuse perspiration is desired. It relieves pain, allays nervous excitement, and produces grateful sleep. It is also good in after-pains, dysmenorrhea, amenorrhea from recent colds, cramps in the stomach, etc. The dose is from half a teaspoonful to one teaspoonful, as needed. Diaphoretic Powder, made from opium, camphor, ipecac and cream of tartar, has about the same range of action as the old time Dover Powder, its dose being from three to five grains. The Mild Zinc Ointment is made from lard, white wax and oxide of zinc, with just enough morphine to cause it to give an anodyne effect when applied to painful ulcers, burns, etc. The Ophthalmic Balsam is made from white precipitate, oxide of zinc, and benzoic acid, with morphine sulphate, olive oil and

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white wax. This forms an admirable remedy for the many cases of sore eyes, and acts kindly and promptly when applied as indicated.

Substitutes for Opium.—We have many remedies that, under specific conditions, become substitutes for opium. For instance, in the pains of rheumatism, the old-time teachings advise the administration of opium, but we may go through the many common cases of rheumatism without the use of opium, in any of its forms. Where motion and cold increase the pain, and where quiet and heat alleviate, Specific Medicine *bryonia* soon relieves. Under opposite conditions, where heat and quiet aggravate and where motion and cold relieve, we administer Specific Medicine *rhux tox.* Where the joints are swollen and painful, hot and red, we use the salicylates; where the tongue and mucous membranes are red, the salicylic acid; if the same parts are too light in color, we use the sodium salicylate, applying hot packs made from a solution of sulphate of magnesium, two ounces to the pint of hot water. When the rheumatic action is directed to the body of the muscles, with a succession of tensive throbs, Specific Medicine *macrotys* is indicated. Where the tongue and mucous membranes are abnormally white, with no great amount of coating upon the tongue, we may do all we wish with sodium bicarbonate. With a dirty white coating on the tongue, we think of an alkali combined with an antiseptic, as sulphite of sodium, or a saline cathartic, in good generous amount. Should the tongue carry a yellowish coating, we administer hepatic cathartics, and should the tongue and mucous membranes show an abnormal red, the anti-rheumatic needed is hard cider, or lemon juice. Should the pain be about the plantar muscles, with or without cramps about the calf of the leg, we give a trituration amounting to one-fourth to one-fiftieth of a grain of sulphur, every hour, until the pain is relieved. Although sulphur is a cathartic when given in large doses, passing through unchanged, as sulphur, in small doses it loses its cathartic action, is taken up by the digestive juices, and after permeating the glands, is eliminated through the skin, as is proven by its action in blackening articles of jewelry the patient may be wearing, which does not take place when large doses are administered. Should the pain involve the sciatic or

OPIMUM, ECLECTIC SUBSTITUTES.

brachial nerves, give Specific Medicine colchicum, using the hot pack of epsom salts solution. If the pain is not relieved, inject a hundredth of a grain of atropine, hyoscyamine or hyoscine hydrobromate deep into the structure, in close proximity to the nerve. Should the rheumatism be traced to a syphilitic origin, administer potassium iodide in good generous doses.

In the treatment of severe cases of colic, where in "Regular Medication" the use of opium is almost universal, should the tongue show an atonic condition of the digestive organs, give Specific Medicine nux vomica, tincture cajeput, a hot whisky toddy, camphor, ginger, capsicum or small doses of Specific Medicine lobelia, or possibly hyoscyamine, or Specific Medicine stramonium or cannabis. Should the tongue show irritation, we relieve the pains with Specific Medicine macrotys, pulsatilla, ipecac, and hot packs, with mucilaginous drinks. Should the pains result from a wrong of menstruation, we think of Specific Medicines macrotys, pulsatilla, viburnum, polygonum, hyoscyamus, gelsemium, etc., with the hot epsom packs. Should we desire an increased action of the skin, where our "Regular" friends would at once think of opium, we would administer Specific Medicine asclepias, or pilocarpus, or any mild nauseant, and get the desired effect, minus the derangement of the secretions.

In the treatment of dysentery, opium should never be used. Should the disease appear after a season of constipation, start the treatment with a large dose of magnesium sulphate, and follow up with five grain doses of the same drug, repeated about every hour or two, until the case is cured. If there be no constipation to start with, give the small doses from the start, and for the pain and tenesmus in the lower bowels inject warm starch-water, to prevent the contact of the sore parts, giving hyoscyamine, if needed.

For the diarrhea of small children, where many physicians would use a preparation of opium, we give a dose of castor oil, or twentieth of a grain doses of calomel, every half hour, following with Specific Medicine nux, chamomile, or ipecac.

The only diarrhea where opium does no great harm, is the purely atonic, with large watery stools; but here again we may better give a solution of hematoxylon, two ounces of the solid

OPIUM, ECLECTIC SUBSTITUTES.

extract to the pint of hot water, with tablespoonful doses, as may be indicated, or Specific Medicine geranium may be used, or any of the many mild vegetable astringents.

In treatment of after-pains in labor cases, Specific Medicine macrotys, with or without small doses of phenacetin, will relieve. In choreic twitchings, where opium is often exhibited, Specific Medicine cypripedium will cure the case in a short time.

In cases of nervousness precluding sleep, where too often opium is used, try Specific Medicines pulsatilla, gelsemium, lupulin, cannabis, passiflora, cactus, hyoscyamus, monobromated camphor, or a sponge-bath of hot epsom salts, as each is indicated.

For headaches, with bright eyes, flushed face, hot head, general condition of excitement, use Specific Medicine Gelsemium; with dull, expressionless face, dilated pupils, drowsiness, use Specific Medicine Belladonna; soreness of head, pain made worse by laughing, use Specific Medicines Bryonia and Macrotys; severe headaches, where patient is pale, with slow, sluggish pulse, where pain is relieved to some extent by assuming a standing position and throwing the head back, and made worse by lying down, use Nitro-glycerin, one-hundreth grain doses; in sick headaches, use generous dose of salts in hot water, to carry off the contents of digestive tract; for the headache of "the day after the night before," use Hyoscyamine, or Specific Medicine Nux Vomica, if the tongue is light in color. In fact, I know of no case of headache where opium is indicated.

The various preparations of Hyoscyamus form the most successful treatment for the opium habit known to therapeutists at this day, being the substances used in most of the secret opium-habit cures.

In the treatment of delirium tremens, opium is second to chloral hydrate or hyoscine, in promoting the needed sleep. The thinking physician acquainted with remedies and indications, can easily substitute more harmless remedies for the opiates so often used, and by so doing will serve his patient better than with the latter. The deep rut into which so many physicians are prone to fall spoils any advance in therapeutics, and tends to therapeutic nihilism. Doctors should get out of

OPIUM, ECLECTIC SUBSTITUTES.

this rut and do their own thinking. Books are too often written by machine men, who follow authority without thought as to other possibilities. Do not be "receipt-book" doctors, but learn the finer points in therapeutics, and their relationship to pathological conditions. Let us be sure of our indications, and above all see to it that we do not leave our patients in a worse condition than when we found them, which will be the case if through our agency, a drug habit, such as the terrible slavery to opium, is produced in any individual.

Drug Treatises, Free to Physicians.

(Mailed free on application, as long as in print.)

Specific Medicine forms of these drugs, are put up in 4 oz., 8 oz., and 16 oz. bottles, and are obtainable from any wholesale druggist or physicians' supply house at list prices. We will mail a 4 oz. package on receipt of price quoted, and 22c. additional to cover postage and the mailing case. 8 oz. and 16 oz. bottles are not available. A list of the supply houses carrying our preparations in each section, will be mailed, on application, to physicians and pharmacists desiring this information and conforming to our rules given on page 32, this Bulletin.

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LIST OF DRUG TREATISES.

SPECIAL.

The accompanying Treatise is a part of a series that, when completed, will give physicians preserving same a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles will consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for the latest information. They will carry such related phases of *Materia Medica*, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

The therapy and medical properties will be written expressly for these fascicles by physicians of great experience in the uses of the particular remedy under discussion, or by physicians whose clinical and professional opportunities are exceptional. The history, description, pharmacy, and chemistry will be written by John Uri Lloyd.

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therapeutics of Lloyd's Hydrastis.—Roberts Bartholow,
M. D.; Wm. Judkins, M. D.; Robert Sattler, M. D.

ses of Specific Medicine Hydrastis.—Chauncey D. Pal-
mer, M. D., Cincinnati, Ohio.

pecial Article on "GONORRHEA, ITS DANGERS TO SO-
CIETY," Geo. F. Butler, M. D.; pages 23 to 34.

pecial Article on "GONORRHEA, ITS TREATMENT AND ITS
CURE," A. F. Stephens, M. D.; pages 35 to 45.

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Preparations are by John Uri Lloyd.

he Illustrations, excepting Nos. 8, 9, 10, and 11, are from
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ustrations 8, 9, 10, and 11 are drawn, from the drug, by
Miss Eda Van Guelpen.

For list and description of Drug Treatises issued to date, see
d cover page.

Drug Treatise No. XXIV will embrace Resinoids, Alkaloids, and
e-called Eclectic Concentrations. (See page 48, this Treatise.)

For prices of Hydrastis Preparations, see page 48, this Treatise.

DRUG TREATISE, No. XXIII.

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Twenty-four Treatises on Drugs and Medicines.

We issue systematically special treatises (historical and therapeutical, 16 to 48 pages each) on invaluable drugs, both new and old, and their therapeutical preparations. These are encyclopedic, and highly valued for their intrinsic worth. They are in great demand by scientific men and physicians, for they give the authentic history, description, constituents, uses, and doses of each drug. The medical uses and qualities and scientific descriptions are written for each treatise by selected authorities. We mail these treatises free, on application, to physicians only. In this connection we call attention to the fact that our preparations are restricted to physicians' use, that we make no remedies for popular use, and that we neither advertise nor supply medicines for the home cure of disease.

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 - Treatise No. XIV embraces Dioscorea.**
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 - Treatise No. XXII embraces Opium, and its Eclectic Substitutes.**
 - Treatise No. XXIII Hydrastis Canadensis.**
 - Treatise No. XXIV will embrace Resnoids, Alkaloids, and the so-called Eclectic Concentrations.**
-

LEWIS & CLARK BROTHERS, Cincinnati, Ohio.

HYDRASTIS.*

Part Used. The rhizome of *Hydrastis Canadensis*.

Common Names :—The term Golden-Seal, first applied to *Hydrastis* by the Thomsonians, refers to the yellow, seal-like scars on the fresh rhizome. This name is common to collectors and the drug trade, but the term yellow-root is also extensively employed. In botanical works the names orange-root and yellow puccoon are sometimes



Fig. 1.
Rhizome of *Hydrastis*.
[One-half Size]

used, while, owing to the berry-like appearance of the fruit, the term ground raspberry has been used by country people. Owing to the fact that in domestic medicine the infusion of the root was employed in eye diseases, the names eye-balm and eye-root have been applied. The bright yellow color produced by its decoction, so useful as a dye to the Indians and early American settlers, gave the plant the following

names: Indian plant, yellow-paint, Indian-dye, golden-root, Indian turmeric, wild turmeric, curcuma, Ohio curcuma, wild curcuma (spelled in old works *kurkuma*), jaundice-root, and yellow-eye.

History:—*Hydrastis* was used by the North American Indians, from time immemorial, as a yellow dye and as a bitter tonic. The first scientific reference, as far as the author can determine, was made by Mr. Hugh Martin, who in 1782 read a paper entitled, "An Account of Some of the Principal Dyes Employed by the North American Indians." In this he refers to *Hydrastis*, as follows:—

"The Indians dye their bright-yellow with the root of a plant which might very well be called *Radix flava americana*. This root is generally from one to three inches long, and about one-half an inch in diameter, and sends out a great number of small filaments in every direction excepting upward; these filaments are as yellow as the body of the root itself. From the root there grows up a stalk about a foot from the ground, and at the top is one broad leaf. A red berry, in

*The most complete study ever made of *Hydrastis*, with many detailed references to authority, and bountifully illustrated, is to be found in *Drugs and Medicines of North America*, 1884, by C. G. and J. U. Lloyd. From this exhaustive study a condensation, which is now revised for this Drug Treatise, was made for *The Western Druggist*, Chicago, 1897, by Dr. Sigmond Waldbott and John Uri Lloyd. To the same publication, *Drugs and Medicines of North America*, must be credited the engravings in this Treatise, excepting Nos. 8, 9, 10 and 11.

HYDRASTIS.

shape and size resembling a raspberry, but of a deeper red, grows on the top of the leaf. This berry is ripe in July."

The Indians imparted the uses of *Hydrastis* to the settlers of America, by whom the drug was used as a domestic remedy and a dye from the earliest times, but it did not attract the attention of the medical profession until 1798, when B. S. Barton mentioned it as a remedy, crediting the Cherokee Indians as his authority. From this date nothing important appeared in medical literature until 1828, when C. S. Rafinesque in his *Materia Medica* devoted considerable space to the drug, and gave a rude illustration of the plant. In 1833, the editor of the *Thomsonian Recorder* added to the foregoing the uses of *Hydrastis* in the Thomsonian practice, and in 1833, Wooster Beach, the founder of Eclecticism, introduced the drug in his *Materia Medica*. The first edition of the *United States Dispensatory* (1833), neglected to mention *Hydrastis*. The second edition (1834), gave it, in the Appendix, a slighting reference which was carried unchanged through nine revisions, being slightly enlarged in the tenth (1854), but the drug was not transferred to the primary department until 1865. The first edition of the *Eclectic Dispensatory* by King and Newton, 1852, gave the drug the first conspicuous consideration it received in medicine, and at once *Hydrastis* and its preparations became prominent in Eclectic therapy. From this period, Eclectic physicians made *Hydrastis* one of their most valued remedies, and both the crude drug and its preparations, as devised by them, became so important as to lead to the drug becoming official in the *Pharmacopœia* of the United States (1860). Few American drugs are now more important than *Hydrastis*, which stands without a rival in its therapeutic field.



Fig. 2.
Leaf and Flower of *Hydrastis*.
[One-third Size]

Description of the Plant:—*Hydrastis* grows in patches in rich, open, hilly woods. The stem is produced from a terminal bud of the perennial rhizome. Its growth is very rapid; a continuance of warm weather for a week or ten days in May, being sufficient to cause it to grow six inches high, and to expand its flowers.

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The fertile stem is from six inches to a foot high at flowering time, round, erect, and about an eighth of an inch in diameter. It is naked below, and at the top apparently forks, one branch bearing a leaf, the other a smaller leaf and flower.

The leaves at flowering time are only partly developed. The lower is the larger, measuring from two to three inches in diameter; the upper, which is about half as large, encloses the flower in the bud, and is usually but partially unfolded when the flower opens. After the plant has flowered, the leaves grow to be six to eight inches in diameter. In shape they are roundish cordate, and have five to seven palmate lobes. The veins are very prominent on the lower side of the leaf.

The petal-like flowers are small, white, and last but a few days. The sepals are seen only in the bud, falling away when the flower expands. The numerous stamens have white filaments, and are the most conspicuous part of the flower. (Fig. 2).

The fruit ripens in July, turning from green to bright red. It is borne on an erect stalk, (Fig. 4), about an inch long. In shape it resembles a large red raspberry, with coarse drupes. (Fig. 5).

Description of the Rhizome:—The fresh rhizome (Fig. 1.) is from one and a half to two and a half inches in length, and from one-fourth



Fig. 4.
Hydrastis Fruit.
[One-fourth Size]

to three-fourths of an inch in diameter. It usually subdivides when it reaches a length of from one and a half to two inches, and not infrequently forms knotty clumps. When dry, the diameter is from one-eighth to one-third of an inch. The color of the fresh rhizome, both internally and externally, is bright yellow, and the plant could be easily recognized by the bright color of the rhizome. (Fig. 6). The weight of the fresh rhizome, with attached roots, aver-



Fig. 3.
Opening Flower
of Hydrastis.
[Natural Size]



Fig. 5.
Berry of Hydrastis
[Natural Size]



Fig. 6.
Section of Hydrastis Rhizome

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ages from eighty to one hundred and seventy-five grains; one hundred and sixty-six parts, after drying, were found to give but forty-six parts. If the root is collected while the plant is succulent and growing, there is greater loss in drying than there is after the fruit has ripened.



Fig. 7.
Dried Rhizome of Hydrastis.
[Natural Size]

The dried rhizome (Fig. 7) is knotty, contorted, rough externally, of a dull brown color. Considerable soil usually adheres to the commercial drug: The young dried rhizome is usually marked by little ridge-like rings, from the sixteenth to the eighth of an inch apart. If it is gathered in the spring of the year, after the plant has commenced to grow, it shrivels in drying, and becomes wrinkled longitudinally. Upon the upper side of the growing rhizome, near the stem, several cup-like projections are usually to be found, which mark the positions occupied by former annual stems. These, by reason of the seal-like scar, give the plant the name **Golden Seal**.

In **Drugs and Medicines of North America**, we called attention to the fact that, in time Hydrastis, as a wild drug, would become extinct. From eight cents per pound, at that date, the price has reached more than \$1.00 (almost \$2.00) per pound, and unless the cultivated drug becomes a factor, even higher figures bid fair to be maintained in the near future. As a matter of record, we will say that about 1870 we knew a lot of 15,000 pounds of dry Hydrastis refused in Cincinnati at eight cents per pound. We reproduce as follows, a part of our remarks, in 1884, on this subject:

“The Past and Present Supply:—Only a small area of country can yield the drug in amount sufficient to repay collection at present prices, and of this section of country, but a limited portion actually contributes any of it to the market. It does not necessarily follow, however, that the plant will not disappear in sections where it now grows abundantly but which have never yielded the drug to commerce. Hydrastis is so sensitive to climatic influence that even a partial destruction of the timber causes it to shrink away, and one turn of the soil by the plow blots it from existence. If it were like *Podophyllum*, content to thrive in woodland pasture, the future would be brighter; as it is, each year witnesses a shrinkage in area and a loss to the world (without economic return), of this peculiarly interesting American plant. Hydrastis has nearly vanished from the rich hill-

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sides bordering the Ohio river, and is no longer found in the populated sections of our valley."—*Drugs and Medicines of North America.*

How well this prophecy has been fulfilled is evidenced by the *Hydrastis* famine that now prevails.

Cultivation:—Contrary to the usual opinion, *Hydrastis* is easily cultivated. It needs be kept free from grass, which smothers it, and prevents increase by adventitious buds on the running fibers. For this reason, rather than the necessity of deep shade, natural patches of *Hydrastis* abound only in rich, soft, loamy woodlands.

Persons familiar with natural *Hydrastis* know that it grows thick in woodland clumps, the patches under the beeches where it luxuriates to best advantage, edging outward, and spreading to considerable size. We were perplexed thereby, because we could not accept that this increase in extent and in compactness came from the seed, which is not abundant, and when ripe is decimated by

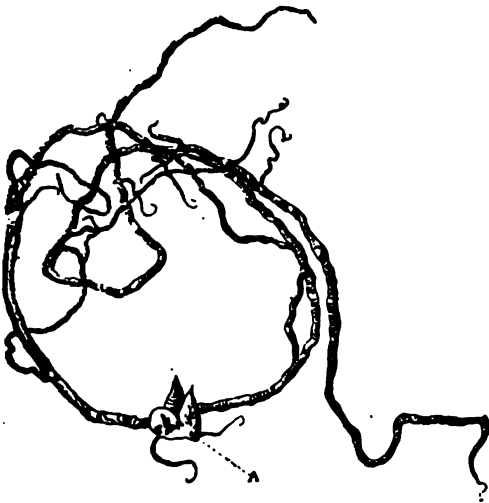


Fig. 8.
(A. shows bud on rootlet)

being eaten by birds and squirrels. Nor does the rhizome divide itself. Experiments instituted in our Kentucky woodlands and in cold frames at our home, show that some of the fibers creep close under the surface of the earth, and throw up adventitious buds (Fig. 8) which become new plants. (Fig. 9.) These fibers often shoot off to great length, two or three feet if the soil is soft, following locations of least resistance, and (Fig. 10) may even cast up more than one bud. Thus the patch thickens and spreads, regardless of seed, which when dropped by birds, or otherwise scattered, serve rather as a nucleus for new patches in new locations, than as multipliers in old ones.



Fig. 9.
(Bud on rootlet, fully developed.)

If a rhizome be sliced transversely into parts carrying buds,

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Fig. 10.

(Young rhizome A, on rootlet, two buds B and C, set on same rootlet. Rootlet shortened in cut from 15 inches long in order to show buds.)

these sprout and increase to a full-grown rhizome. (Fig. 11.) They send out tendrils producing buds that thicken the patch rapidly, if the plant be in rich loam, free from grass. Under such conditions the plant thrives readily, and we see no reason why Hydrastis should not be easily cultivated, and prove a profitable crop after the few years necessary to its establishment. But it is a delusion to look to *seeds* as the multipliers. Cuttings and adventitious buds on the fibers must be the method of propagation.



Fig. 11.

(Cutting of Hydrastis. Rhizome sending up stalk from eye.)

Adulterations:—The substances which usually contaminate our indigenous drugs, are

to be found mixed with Hydrastis. Fragments of foreign roots such as serpentaria, cypripedium, senega, collinsonia, jeffersonia, trillium, etc., are common, these admixtures usually resulting from the carelessness of the collector. In a few exceptional cases, however, we

have found such sophisticants to constitute more than half the gross weight of several bales of the drug, the adulterations under these circumstances being intentional.



Fig. 12.

Stylophorum diphyllum
[Half Size]

The root of *Stylophorum diphyllum*, when fresh, resembles Hydrastis in color, having a golden yellow juice, but upon drying it changes throughout to a dirty gray. Our attention was once called to a lot of one hundred pounds entirely made up of the root of this plant, which was thrown upon the market as an extra "Large Golden Seal." The appearance of this root (Fig. 12) does not permit of a confusion of it with the rhizome of Hydrastis. In

our opinion, the color and peculiar odor of dried Hydrastis will pre-

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vent any careful person from mistaking it for the root of any other plant known to us. However, a large quantity of inferior Hydrastis is in commerce, some of it objectionable because of its having been gathered too early in the season, other portions because of dirt, mold, or admixtures. In consequence of these facts, much of the commercial drug is unfit for use, and purchasers should exercise care in its selection.

HYDRASTIS CONSTITUENTS.

Berberine, (Hydrastine.) (Fig. 13.) One of the conspicuous coloring matters of Hydrastis is an alkaloid, berberine, but with it other yellow substances are associated. To the dried yellow extractive carrying all these substances, Rafinesque, in 1828, applied the name Hydrastine. This name the Eclectics adopted for the salts (Figs. 14 and 15) and yellow alkaloidal compounds (berberine), used by them so extensively, and to this name they adhered until after



Fig. 13.
Berberine.
(Slightly Magnified)



Fig. 14.
Di-berberine Sulphate.
(Natural Size)

1880. Then, owing to the fact that the term berberine had been affixed to it in Europe, and through persistent use had established itself in outside scientific publications, they relinquished the name hydrastine, which is, by priority, and also by usage, the rightful name of berberine.

In this connection, as a matter of record, it may be said that, in

1824, Huttenschmid gave the name jamaicine to the yellow coloring matter of what he thought was *geoffroya inermis*: that Chevallier and Pelletan (1826), gave the name xanthopicrite to the yellow coloring matter of *xanthoxylum clava herculis*: that Rafinesque (1828), gave the name hydrastine to the yellow coloring matter of *hydrastis canadensis*, and that, last of all, Buchner and Herberger (1830), gave the name berberine to the yellow coloring matter of *berberis vulgaris*: and thus is seen the remarkable fact that the three names preceding the word berberine, were brushed aside by the one least entitled to consideration. It should furthermore be added that all these names were applied to extracts of the d and



Fig. 15.
Di-berberine Sulphate
(Magnified 60 diameters)

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that the alkaloid was not established until Dr. George Kemp, in 1839, made a salt of berberine and picric acid.

Hydrastine (Fig. 16), is the characteristic white alkaloid of the drug. It was discovered in 1850 by Mr. Alfred B. Durand; again in 1856 by Professor E. S.

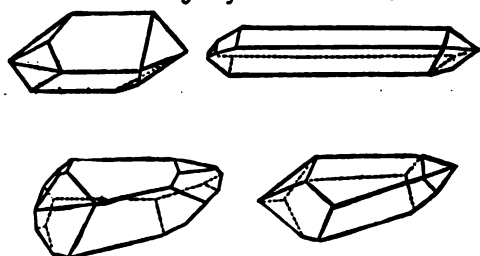


Fig. 16.
Hydrastine

[Natural Size] (By F. B. Power.)

Wayne, and in 1862 by Wm. S. Merrill. Neither of the latter named gentlemen was aware that the alkaloid mentioned by themselves had been previously discovered by Durand, and none of them obtained it pure. It was reserved for Mr. J. Dyson Perrins (1862) to prepare pure Hydrastine. The chemistry of Hydrastine was subsequently studied by various workers, and its constitutional formula established in 1891 by Dr. M. Freund. Likewise, the constitutional formula of berberine was brought to light, in 1890, by W. H. Perkins. Pure Hydrastine is colorless, and dominates the peculiar alkaloidal constituents of the drug.

Third Alkaloid of Hydrastis:—The first intimation of the existence of a third alkaloid in Hydrastis root was given in 1873 by A. K. Hale. The observation was confirmed in 1875 by John C. Durt, who gave additional reactions, and produced a drawing of the sulphate of the new base. Afterwards, (1878), Mr. Hermann Lerchen, following the directions of his predecessors, obtained the new alkaloid, which he named xanthopuccine, on account of the yellow color of the alkaloid as he obtained it.

In 1888, F. Wilhelm, in Professor E. Schmidt's laboratory, incidentally obtained the alkaloid in minute quantity. In 1891 and 1894, Professor E. Schmidt succeeded in isolating it from Hydrastis root in larger amounts. He next received relatively large quantities of the hydrochlorate of the third alkaloid from E. Merck, and was thus enabled to work out the chemistry of the newly discovered alkaloid, which he named canadine, rejecting the former name xanthopuccine, as the pure alkaloid as made by him is white, not yellow.

Therapeutics of the Hydrastis Alkaloids.

Therapeutics of Berberine:—This yellow alkaloid is a bitter tonic. For many years its salts were employed by Eclectic physicians under the name Hydrastine salts, but, as shown (page 9) the term was relinquished in favor of the word berberine, which came much later, but has never been extensively employed by Eclectic physicians. For a time it was hoped that this yellow alkaloid would prove to be the valuable constituent in eye diseases and in mucous membrane affections, where decoctions of Hydrastis root are so effective. But this proved a delusion. Indeed, in such directions if in small amount it is useless, and if in large amount, harmful. Its negative value as a topical application in eye and ear are typical of its influence in connected directions, as shown by the clinical investigation.

STIS. HYDRAS.

Robert Sattler, M. D., from which we extract as

request of Prof. J. U. Lloyd, I commenced a series of observations to determine the physiological properties and therapeutic uses of two soluble salts of Hydrastis, i. e. di-berberine sulphate, and hydrochlorate of hydrastine, which he kindly furnished me, in powder form, and in one, two and four per cent solutions.

The investigations were conducted at my clinic, and the records of the progress and results of the cases in which either remedy was employed, were carefully compiled by the clinical assistants, Drs. C. H. Castle and C. R. Holmes.

Berberine Di-sulphate:—PHYSIOLOGICAL ACTION:—Observations were begun with the berberine solutions. Two or three drops of a two per cent solution dropped into the conjunctival sac caused slight irritation and injection of the palpebral and ocular conjunctiva. The objective and subjective disturbance, however, subsided quickly.

A four per cent solution excited greater local irritation, more profuse flow of tears and mucous, and also more pronounced subjective discomfort. The duration, however, of these symptoms was brief.

Therapeutic Application of Berberine:—To test its efficacy to relieve or modify catarrhal alterations of the conjunctiva (conjunctivitis simplex, acute catarrhal conjunctivitis, etc.) two and four per cent solutions were resorted to, but in every case the results were negative, or at least, unattended by appreciable good effects, even after prolonged and systematic use.

The principal objection to the di-sulphate of berberine solution was not so much the discomfort and irritation it induced, but principally on account of the deep staining (yellow) of the adjacent parts.

The hyperemia of the conjunctiva produced by the instillation was too transitory, and was not effectual in modifying, after repeated trials, the local symptoms, or in bringing about relief from the scratching and burning sensations produced by the disease. Owing to almost uniformly negative results, additional observations were not made.

If the use of the berberine solutions proved of little or no value in the treatment of catarrhal affections of the eye, the use of both strong solutions and the powder in substance proved absolutely ineffectual when resorted to for the purpose of modifying or arresting catarrhal or purulent discharges from the middle ear.

In the following cases it was applied, a four per cent solution dropped into the ear twice a day, after syringing, and the insufflation of the powder was resorted to once a day.

(In all these it proved negative or harmful.—L.)

In a number of other cases the remedy was used, but after several days was abandoned for the reason that no improvement or change occurred to warrant its continuance.

"When resorted to in solution, coagulation or precipitation occurred at once, but no pain attended its use. The principal objection to its use in this locality, and this applies particularly to the powder, is, that rapid incrustation, due to chemical transformation from contact with the discharge, occurs. The staining of the parts also constituted an objectionable feature. The removal of the incrustated masses from the external canal became necessary, on account of discomfort and pain produced. In some of the cases, the removal was tedious, difficult and painful."—*Drugs and Medicines of North America*, pp. 172-173. 1884.

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As a natural constituent of Hydrastis, berberine serves a useful purpose; as a bitter tonic it is helpful; but its sphere of activity is as a fortifying, or even extraneous agent, in prescription combinations that have reputations in other directions.

Therapeutics of Hydrastine :—This white alkaloid dominates the basic energies of Hydrastis in a toxic direction, for the alkaloid Hydrastine is a poison. Its energetic nature in lower animals was fully shown by Professor Roberts Bartholow, M. D., in a long article in *Drugs and Medicines of North America*, from which we extract the following.

"The Physiological Effects and Therapeutical Uses of Hydrastis :—(Written for this publication by Prof. Roberts Bartholow, M. D., LL. D., of the Jefferson Medical College of Philadelphia.) But little attention has heretofore been given to the physiological action of Hydrastis. It is true, Schatz, Fellner, Slavatsky, and some others have made some studies, but their results differ so widely from those herein detailed that it may be questioned whether they operated with sufficiently good specimens of the drug. The alkaloid hydrastine with which the following experiments were made was sent to me by Prof. J. U. Lloyd, the editor of this journal, who is, I hope I may be permitted to say, unimpeachable authority.

Three grains of the hydrochlorate caused the death of a frog in four minutes, whilst forty minims of the fluid extract proved fatal in twelve minutes, the mode and character of the action being the same. The results in rabbits were corresponding. In general terms, the effects of Hydrastis are those of hydrastine in both classes of animals, but minute differences may hereafter be detected on closer examination.

General Effects of Hydrastine Hydrochlorate in Cold-Blooded Animals :—When ten minims of the 33 per cent solution are injected into the abdominal cavity of a frog, the following phenomena ensue: In two minutes muscular rigidity is manifest, with extension of the limbs and inability to move; in three minutes the cutaneous reflex is so heightened that the gentlest tap on the skin causes a tonic convulsion from above downwards; successive tonic convulsions then ensue, with fibrillary trembling between, until at the end of four minutes death occurs in a strong tetanus. On opening the chest, the heart is still found in action, but in a few minutes ceases to diastole, all the cavities being full of blood, and its muscular tissue is found to be irresponsive to electrical irritation.

In a rabbit weighing about fifty ounces, forty minims of the same solution, or thirteen grains, caused death in five minutes with the same phenomena—that is, with tetanic convulsions, the head drawn forcibly back, the limbs extended and the respiration fixed, with increasing cyanosis of the ears and mouth. The heart continues its action after respiration has entirely ceased, and on opening the chest then it is still found in slow movement, the auricles most active and all the cavities distended with blood. The muscular tissue of the heart does not respond to electrical or mechanical irritation.

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It follows from the foregoing that Hydrastis belongs to the group of excitomotor agents. It heightens perception, the cutaneous excitability and the reflex functions, and it causes death by tetanic fixation of the respiratory muscles.

Antagonism Between Hydrastine and Chloral:—The number of experiments has been too small to formulate positive conclusions, but enough has been learned to indicate that chloral antagonizes to a large extent the increased reflex excitability and the tonic convulsions caused by hydrastine. It is probable, indeed, that the antagonism will be found as extensive in range as between chloral and strychnine. Thus far I have not had the opportunity to ascertain the lethal dose of hydrastine. Until that is determined, the power of its physiological antagonists can not be measured with accuracy. Further experiments are making on this point and will be announced hereafter.

Strychnine and Hydrastine:—A remarkable correspondence can be traced between the actions of strychnine and hydrastine, but the power of the former seems to be the greater, whilst in extent of action the latter seems far more. Both exalt the reflex function of the cord; both induce tetanic convulsions, and both cause death by arrest of the respiratory movements in a tonic spasm. Hydrastine more affects the peripheral nerves and muscles, and to a much greater extent impairs the contractility of the cardiac muscle.—*Drugs and Medicines of North America*, pp. 156-7-8-9. 1885.

These extracts from Professor Bartholow's six-page article on Hydrastis indicate that Hydrastine is more poisonous than some believe it to be, a fact shown in our early experience with Lloyd's Hydrastis, where the alkaloidal proportions in the preparation used by Dr. Bartholow proved so irritating as an application to mucous membranes, as to demand immediate reduction to less than one-third the amount previously employed.

The third alkaloid of Hydrastis has no established therapeutic influence or value. In this connection it must be remembered that the drug Hydrastis, upon which the reputation of Hydrastis preparations was established, carries a very complex structure in which the natural alkaloidal combinations are unknown, and in which they are but a part of a whole. It should also be borne in mind that, so far as we know, the uses of Hydrastis in medicine were clinically established, by means of preparations of the whole plant.

Pharmaceutical Preparations of Hydrastis.

Of the alkaloids of this drug, Hydrastine and Hydrastinine hydrochloride are official, Berberine being ignored in the Pharmacopœia. The pharmaceutical preparations of the Pharmacopœia embrace the fluid extract, glycerite, and tincture of Hydrastis.

By Eclectic physicians, Lloyd's Hydrastis, the Specific Medicine, and the non-alcoholic, Liquid Hydrastis, are recognized as the preferable forms, each having a special therapeutic field. The Specific Med-

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icine is used in directions where a tonic is required, as shown in the Therapeutic Uses, this treatise, but the alcohol present prevents its use in the majority of mucous-membrane diseases, and in injections. For such purposes, the non-alcoholic Lloyd's Hydrastis has an enviable reputation, and is generally used by physicians throughout America. Liquid Hydrastis is also non-alcoholic, but, owing to its yellow qualities stains the linen, and is fast being abandoned in favor of "Lloyd's Hydrastis."

Among the Eclectic therapeutic compounds carrying Hydrastis, is to be mentioned the long celebrated Neutralizing Cordial of Beach. The improved form of this cordial, under the name **Glyconda**, is free from sugar, is anti-fermentative, and does not induce saccharine fermentation in the stomach or bowels.

Therapeutics of Hydrastis :—Our Drug Treatise No. V tells how Chionanthus was introduced for one purpose and became established in therapy for another and a very different use. The same is true of Hydrastis, which was used originally, and long thereafter, as a bitter tonic and a febrifuge, but is now invaluable in directions then unseen. Then, too, the alkaloidal record of Hydrastis is chameleon-like. The once overvalued yellow alkaloid, **berberine**, was at first considered as the only proximate constituent, and was credited with the entire therapeutic value, all else being discarded. The white alkaloid hydrastine then became conspicuous, but in our opinion it, too, is not only overvalued, but if in excess, is irritatingly harmful in many Hydrastis preparations, and in some directions should be present in very small amounts, if at all. (See American Dispensatory, p. 1025.)

Hydrastis is a conspicuous example of a drug dominated by aggressive alkaloidal complexities that in the day of heroics naturally caught the attention of early observers. For this reason all Hydrastis preparations were overbalanced, the alkaloids being permitted to remain in excessive proportions. In the most conspicuous diseases in which Hydrastis has been established as a remedy, the separated alkaloids are individually useless or nearly so, and when they are present in excess in a pharmaceutical preparation, become harmful. Nor do they parallel a balanced pharmaceutical preparation of the whole Hydrastis, in which, if they be subordinated, or even nearly excluded, the milder structures become much more valuable than is otherwise possible.

The late John King, M. D., introduced Hydrastis into recognized therapeutics, his article in the American Dispensatory, 1852, giving the drug its first authoritative position. His continuous use of Hydrastis, mainly in decoction and infusion, and his enthusiastic

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lectures on the subject, for years, establish him as the father of its professional medical record. For years, in connection with Dr. King, the writer of this article vainly sought to discover, for use of Dr. King in his practice, a proximate alkaloidal principle or salt, to take the place of the decoction. Dr. King gave careful trial to each preparation submitted to him, but invariably insisted that no one of them served the purpose of the decoction, rejecting each and every alkaloid or salt, and mixtures of all of them, as not paralleling in action the decoction of the whole plant. It will be observed that in his article, (to follow) the decoction is given every preference, and that Dr. King decries dependence on berberine, as he also opposed hydrastine.

This was before "Lloyd's Hydrastis" was discovered. In after life, Dr. King employed this preparation exclusively, in cases where, in preceding years, the decoction was used. Indeed, it may be said that "Lloyd's Hydrastis" was the outgrowth of the preparations made for the personal use of Dr. King, who enthusiastically hoped for the evolution of some Hydrastis preparation, that in its field of usefulness might take the place of the decoction upon which he was then forced to depend.

The Uses of Hydrastis Canadensis in the Eclectic School.

(Written for DRUGS AND MEDICINES OF NORTH AMERICA, by Prof. John King, M. D., Professor of Obstetrics and Diseases of Women in the Eclectic Medical Institute, Cincinnati).

While as a general vegetable tonic, Hydrastis is inferior to certain other bitter tonics, as gentian, colombo, etc., it will be found superior to them in the treatment of subacute and chronic inflammation of mucous membranes, upon which it exerts a peculiar tonic and slightly astringent effect, whether taken internally, or applied locally. In the majority of cases, its local application is followed by more prompt and positive action than from its internal administration. Whether its power of contracting vessels be owing to a tannic acid, or to a principle similar to that in ergot, which causes a like effect, has yet to be determined.* Administered internally, it has proved efficacious as a tonic, in enfeebled conditions of the alimentary canal with infants and children; in restoring tone to the intestinal mucous coat after severe attacks of diarrhoea, dysentery, and other debilitating maladies, and in removing the indigestion, and restoring the appetite in those cases of indigestion and anorexia of adults due to an abnormal condition of the mucous coat of the stomach. As a local application it has proved valuable in conjunctivitis, in ulcerations of the mouth and fauces, in vaginal and uterine leucorrhœa, and in all cases of enfeebled mucous tissues. In the chronic forms of cervical and corporeal endometritis it has acted with success, being applied in the form of powder, made by evaporation of a decoction of the root, rubbed up with simple cerate or vaseline, and introduced into the

* Do not construe this as referring to the yellow alkaloid, berberine.

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uterine cavity by means of a tube made for such a purpose. In combination with other agents, it exerts beneficial influences that can not be had by the employment of either of the articles separately. Thus, a strong decoction of the root, to which has been added one-third or one-fourth its volume of tincture of capsicum, forms a successful application to corneal ulcerations, and to all acute ulcerations of mucous tissues. In ulceration of the bladder, the decoction mixed with an equal volume of decoction of geranium, and injected into the bladder, has effected cures even in cases where all previous treatment had failed. This same decoction has never failed me yet, as a local application in ophthalmia neonatorum. The decoction, employed in combination with decoction of caulophyllum, has been found efficacious in thrush and aphthae of infants and children. Berberine, or muriate of berberine, does not appear to possess the positive action upon abnormal mucous tissues, that is manifested by the root in decoction, fluid extracts, or a powder made by evaporating the decoction to dryness.

Supplement.—The preceding statement was written some four or five months ago, and placed in the hands of Prof. J. U. Lloyd. To my great pleasure and surprise I have just noticed that in the section of Gynaecology in the Congress of Naturalists and German Physicians, held at Fribourg, in Brigau, Dr Schatz of Rostock, invited the attention of his colleagues to the American Hydrastis Canadensis, the therapeutical effects of which rather astonished him. He found this agent efficacious in hemorrhage from myoma, from congestive dysmenorrhea from subinvolution, also in those attending metritis and endometritis, as well as those occurring at the period of the menopause. He supposes the medicine acts upon the uterine mucous membrane, exciting vascular contractions, through which mechanism it diminishes congestion of the genital organs, thus acting very differently from ergot, the influence of which is exerted upon the uterine muscular tissue.—*Drugs & Medicine of North America*. p. 170-171. 1885.

The uses of Hydrastis are so varied, and its preparations so many, that it is impossible to do more than make a synopsis of the principal applications of the drug, as shown by its established preparations. This is best accomplished by quoting from the following authorities, to whose publications and the Dispensatories the reader is directed for further details:

"I will give Hydrastis merely a brief notice, as it is in such general use for all the purposes of a tonic, that my readers know as much about it as I do. It improves the appetite and facilitates digestion; but beyond this, it relieves gastro-intestinal irritation.

Its topical action, however applied, is that of a tonic, strengthening the circulation and nutrition. It is in common use, for these purposes, in diseases of the skin, diseases of the eyes, and diseases of the mucous surfaces.—*Scudder's Specific Medication*.

In its therapeutie influence, its widest range of action is upon the stomach, in functional disorders of that organ. It is the most natural of stimulants to the normal function of digestion. Its influence upon the mucous surfaces renders it most important in catarrhal gastritis and gastric ulceration. It supersedes all known remedies as a local, and also as a constitutional, tonic when this condition is present.

In administering this remedy, if there is irritation, the fluid and less bulky

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preparations are preferable. If there is marked atonicity, with inaction of the stomach and lack of nerve sensibility, the powdered drug in five grain doses is the most useful. This increases the tone, reduces abnormal secretion, stimulates the normal secretion, promotes the appetite and increases the quantity of the digestive juices, and thus favors the digestion. It is most excellent in indigestion in such cases acting in a more rational manner than the digestives, which have no influence beyond that immediately exercised upon the food within the stomach.

In extremely irritable conditions, a solution which contains one or two drops of the Specific Medicine Hydrastis, or the Colorless Hydrastis, or in extreme cases the one-twelfth to the one-fourth of a grain of the Hydrochlorate of Hydrastine, is preferable to large doses of Hydrastine, or the powdered Hydrastis. In some cases powders, or the precipitated principle, will irritate the stomach, producing weight, distress, or even mild pain if the stomach is empty. In such cases it is best given after a little food has been taken, or in conjunction with the subnitrate, or the oxide of bismuth, or with a digestive if the stomach contains food.

In those cases of atonic dyspepsia, where the entire apparatus, including the liver, is stagnant and inoperative, one-fourth of a teaspoonful of the fluid Hydrastis, or of the Colorless Hydrastis dissolved in water, will restore a normal condition of the glands and of the entire mucous membranes.

The agent relieves the chronic constipation of plethora or muscular inactivity in relaxed, inactive, feeble case. Its influence is encouraged by combination with *nux vomica*. It overcomes hepatic congestion in such cases, and catarrh of the gall ducts. It may be combined with *podophyllum*, *leptandra*, or *iris*.

It is a most superior remedy in the atonic conditions of these organs in chronic alcoholism, and if combined with large doses of capsicum, and with forced nutrition, will in great part supply the demand for alcoholics, and assist in the cure of the disease. It acts as strychnine does in the cure, and may be most beneficially given in combination with that agent."—*Ellingood's Materia Medica and Therapeutics*.

"The whole drug, including the alkaloid Hydrastine, appears to stimulate the respiratory and circulatory apparatus, imparting increased tone and power. Arterial tension is augmented, and blood pressure in the capillaries increased, rendering it valuable, like *belladonna* and *ergot*, in overcoming blood stasis. Its action upon the nervous system has been compared to that of strychnine (*Ellingwood*), though less energetic, but more permanent. Thus the tone imparted to the heart muscle is permanent, rather than intermittent or spasmodic (*ibid.*). The sensibility of the nerve endings is blunted by Hydrastis in excessive doses, and in the lower animals large doses of the alkaloid have produced death. No such toxic action, however, has been observed upon man. Muscular nutrition is increased under the judicious administration of Hydrastis, making it a valuable agent in muscular debility, and in altered states of the muscles, particularly of the unstriped variety.

Hydrastis is bitter to the taste, and induces increased activity of the salivary glands. It sharpens the appetite, and aids digestion when indicated. *Schaltz* has shown that it increases contraction of the muscular fibers of arteries, without affecting other muscular tissues of the tubular organs. He has also shown that it decreases congestion of the genito-urinary tract. *Rutherford*, who investigated it, concluded that it was a hepatic stimulant, and in less degree

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stimulant to the intestinal tract. Its power as a hepatic stimulant is, however, probably overrated, while as a stimulant of the gastric and intestinal mucous surfaces its action is marked. Hydrastis exerts its chief action upon the mucous and glandular structures, and to some extent, through its white alkaloid, upon the nervous system.

Hydrastis is a valuable drug in disordered states of the digestive apparatus, especially when functional in character. It is not adapted to all classes of cases, but is rather to be considered as indicated in disorders of a sub-acute character, and in atonic states with increased flow of mucous. In sub-acute and chronic inflammation, with free secretion, it will be found to render good service. As a general bitter tonic, it resembles, though it does not equal, calumba and gentian, but is more applicable to debilitated conditions of mucous tissues. Beginning at the mouth, its beneficial action may be traced throughout the alimentary canal. For apthous stomatitis it is equaled only by coptis and phytolacca. It is not the remedy in this disorder when the mucous secretions are checked but is best adapted to subacute forms, bordering on a chronic state. As a remedy for various gastric disorders, it will take a leading place, especially if it be borne in mind that it is never beneficial, but on the contrary does harm in acute inflammatory conditions. When, however, the trouble is subacute and semi-chronic, and especially with mucorrhœa, or even secretion of pus, the drug will give good results. It is indicated in gastric irritability, relieving the irritation, and afterward restoring the tone of the parts. For years the powdered root was made into aqueous infusion, which, when cold, was employed with marked benefit, but now we have pleasanter preparations which give equally as good results, without entailing the unpleasantness of swallowing a large quantity of bitter and crude medicines.

Prof. Webster (*Dynam. Therap.*) calls attention to the use of Specific Medicine Hydrastis in cases of myalgic tenderness and soreness. He regards it as indicated where the unpleasant symptoms are masked during rest, but aggravated by pressure and by motion. These myalgic symptoms may be due to various causes, often resulting as reflexes from uterine, rectal, and prostatic disorders. He also includes in the category of myalgic complaints, headaches resulting from reflexes in which the scalp muscles are involved; pectoral tenderness due to lacerated cervix uteri; and the muscular pains caused by anemia, resulting from uterine, hemorrhoidal, and other hemorrhage. The dose recommended is from the fraction of a drop to one drop.

Hydrastis should be remembered in convalescence from diseases having excessive mucoid discharges, or where hemorrhage has played an important part.

Dose of Hydrastis Preparations:—The usual dose of Specific Medicine Hydrastis ranges from the fraction of a drop to 30 drops; of Lloyd's Hydrastis, from 5 drops to 1 drachm; of infusion of Hydrastis (3 i to aqua Oj) from $\frac{1}{2}$ to 1 fluid ounces; locally, Lloyd's Hydrastis, from full strength (ulcerated cervix uteri), to a dilution of 1 in 20 in water. Dose of the powder, from 10 to 30 grains; of the tincture, from 1 to 2 fluid drachms; of the hydro-alcoholic extract, from 1 to 5 grains; of the fluid extract, 10 to 60 minims; Hydrastine (Eclectic), 1 to 6 grains; of Hydrastine Hydrochlorate, $\frac{1}{4}$ to 1½ grains; Berberine 2 to 20 grains; Berberine Hydrochlorate, 1 to 5 grains; Berberine Sulphate, 1 to 5 grains.

—Feller, in *Am. Disp.*

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The Homeopathic Uses of Hydrastis Canadensis.—By Edwin M. Hale, M. D. (Emeritus Professor of Materia Medica and Therapeutics in the Chicago Homeopathic College.) This indigenous drug, first introduced into our school by myself in 1856, has since obtained a great popularity. Many provings and physiological experiments have been made with it, which, combined with an extensive clinical experience, have pretty clearly defined its sphere of action and its place in homeopathic therapeutics.

Its sphere of action, although not wide, is yet very important. It appears to me to have a decided and specific affinity for

(1) The mucous surfaces—especially those with which it may come in contact.

(2) The mucous glandular system.

(3) The nutritive system.

(4) The circulatory system.

Action on the Mucous Surfaces.—The natural secretion is at first increased; then it becomes abnormal in quantity and quality. At first clear, white, tenacious and transparent, it becomes yellow, thick, green, and even bloody, but always tenacious, capable of being drawn out in long strings. In this respect it resembles the mucous discharge caused by kali bichromicum, ammonii bromidum, and cubebs. It differs from the mucous flux of stannum, copaiva, and ammonii chloridum, which is thick, lumpy, and falls in masses. This primary mucous flux of hydrastis may pass on to erosion, muco-purulent discharge, and ulceration. It probably causes this condition by inducing a primary capillary hyperæmia; next a passic stasis, together with a stimulation of the mucous glands. Finally, from exhaustion or atrophy, the sources of the secretion are cut off, and the mucous membrane becomes dry, glazed, ulcerated, and its functions destroyed. Pathologically, this disease of the mucous membranes may be called catarrh or blennorrhæa. Other medicines cause similar conditions when taken internally, not only in the mucous surfaces with which they come in contact, but through which they may be eliminated (copaiva, kali iodum, cubebs, grindelia, etc.); but we have as yet no proof that hydrastis is eliminated through any mucous surfaces, such as the bronchii, urinary or generative tract. If it acts on these surfaces at all, when taken internally, it must act on them by disturbing the circulation in the capillaries. I have never been able to cure blennorrhæa as of the above named surfaces by its internal administration, unless it was used at the same time topically; but I do not mean to dispute its ability to do so. Certain it is that we get the best curative effects when it is locally applied to diseased mucous membranes. We have used it successfully in mucous conjunctivitis; otorrhea; diseases of the eustachian tubes; catarrh of the nasal passages, pharynx, fauces, stomach, intestines, part of the gall duct, urethra, vagina, uterus (leucorrhæa, gonorrhæa, etc.). These catarrhal affections may be simple, or severe, and may extend to erosions or ulcerations. If they begin in simple blennorrhæa, they are all amenable to the curative action of hydrastis.

Action on the Skin.—The skin being analogous to mucous membrane, it has been supposed that a drug which acts on the one would act similarly on the other. One of our provers records that it caused an erysipelatous rash on the face, neck, hands, and fingers, with great heat and irritation, which continued for six days, when the skin enfoliated; others, that it caused pustular eruptions. Now, the cutaneous analogues of a mucous catarrh, are erythema, moist

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eruptions, eczema, and even ulcers. In domestic as well as homeopathic practice it has been used successfully in skin affections. We have recorded cures of lupus, psoriasis, excoriations, rhagades, ulcers, boils, and even variola.

Action on the Nutritive System.—The Eclectics have always believed hydrastis to be a general tonic. Our experiments seem to show that it acts similarly to cinchona, columbo, gentian, berberis, and others of that class. When given in medicinal doses of the crude drug, it seems to increase the general tone of the organs of nutrition and assimilation. The appetite is increased, digestion is more vigorous, and the bodily weight and strength increases. But if the drug is continued too long, the improvement ceases, and retrograde processes set in. A gastro-intestinal catarrh obtains, digestion fails, assimilation is deficient, constipation and hepatic torpor are present. All tonics, even iron, act similarly when the doses are too large or are continued too long. In these facts we see that hydrastis and its analogues are homeopathic to debility, atony, retrograde metamorphosis, and that the drug should be used in small (not infinitesimal) doses, and not continued too long even in small doses.

It is curative in all disorders depending on the above conditions; namely, generally impoverished blood, emaciation, stomatitis, dyspepsia, indigestion either in the stomach or intestines, biliousness, constipation, etc. The action of hydrastine on the liver was established by the experiments of Rutherford, who calls it "a hepatic stimulant of considerable power, and but a feeble intestinal stimulant."

Action on the Muscular System.—Hydrastis acts as a tonic. I do not think this acts through the nervous system, as does nux vomica, but through the blood. The increased assimilation of well-digested food allows the muscles to be better fed and better nourished.

While I believe hydrastis to be a powerful tonic and restorative, I am obliged to deny it any specific anti-periodic (anti-malarial) properties. I tested it thoroughly during a practice of fifteen years in a malarious district. It is not and can never be a rival or substitute for cinchona. The practical physician knows that all bitter tonics have some reputation in ague, *e. g.* chelone, ostrya, euonymus, and others; but they are not anti-malarial medicines. They may be, and doubtless are, capable of removing the malaria cachexia, in which the recuperative forces of the system are too feeble to resist the habit of recurring paroxysms, which are not true ague paroxysms. All these bitter tonics, particularly hydrastis and its active principles, berberine and hydrastine, have the power of restoring the vital forces sufficient to overcome this habit. In this respect hydrastis is more of a rival of cinchona (which is worse than useless in cachexia)—it is a most valuable substitute. In all cachexias hydrastis is an indispensable remedy. Even in anaemia, a chlorosis, it greatly aids iron in restoring the integrity of the blood.

In the debility after wasting diseases, fevers typhoid or gastric; after losses of blood, or due to depressing emotions, also in neurasthenia, the hydrastis berberine phosphate or hypophosphite have done me excellent service. We have found it very useful in gall-stones, not so much for the colic caused by their passage as to remove the tendency to their formation. It may dissolve the biliary concretions by causing a flow of thinner bile, or aid in their expulsion by removing (as in jaundice) the catarrh of the gall duct. Several German Homeopaths have reported cases of tumors of the stomach and pylorus which disappeared under the careful and protracted use of hydrastis.

—*Drugs and Medicines of North America, 1885.*

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Specific Use :—To improve the appetite and digestion. It also exerts a special influence on nutritive processes.

Dose :—℞. Specific Medicine Hydrastis, ʒj.
Water, q. s. ℥iv.

Misce.

Sig. A teaspoonful three times a day.

Specific Medicine Hydrastis is a valuable tonic to the circulatory and mucous structures. Few agents have acquired a greater reputation in the treatment of disorders of digestion than Hydrastis, especially when associated with irritation or debility of the gastric mucous surfaces. It is particularly useful in acute indigestion due to sudden changes of diet, and to abuse of ice-water, iced tea, etc. (ice-water dyspepsia). Hydrastis is valuable in chronic inflammations of the glands, as well as of the mucous structures. Hepatic torpor with constipation and chronic gastritis, are relieved by small doses of Hydrastis. It is a useful topical application to the membranes of the throat with relaxed tissues, free secretions, and dilated capillaries. It relieves nursing and aphthous sore mouth and is invaluable in ulcerations of the body orifices, as in rectal ulcers, fissures in anus, etc. Hydrastis is admirably adapted to control passive bleeding when due to atony of the coats of the vessels. This action renders it valuable in hemorrhagic flows from the uterus, due to various causes of debility.

LLOYD'S HYDRASTIS.

“An unofficial preparation from which is excluded the coloring matters of the drug, and other undesirable constituents. This special preparation contains both organic and inorganic salts, and does not stain. It has been used for many years by the medical profession.”

Having thus presented a brief but yet comprehensive history of Hydrastis and its principal pharmaceutical and alkaloidal derivatives, we come to a form in which, as a remedy in mucous-membrane diseases, Hydrastis has become of national importance. The history and therapeutic field of this preparation, known as **Lloyd's Hydrastis**, can perhaps be best presented by reproducing verbatim, as follows, a treatise designed to answer comprehensively the questions of physicians desiring the information embodied therein :

“Before the date of the investigations that resulted in the production of Lloyd's Hydrastis the useful constituents of Hydrastis, as shown in the preceding pages, were supposed to be colored. Although

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a white alkaloid had long been known, no preparation other than yellow Hydrastis compounds had ever been used in medicine. This opinion was based on false premises, for the yellow alkaloids and coloring matters (berberine preponderating) are valueless, and even harmful, in the direction Hydrastis is now most employed. This fact we demonstrated between 1880 and 1885, when it was shown that where "Lloyd's Hydrastis" is now celebrated, the yellow alkaloid and its salts were decidedly objectionable. The white alkaloid was also determined to be but one of the colorless Hydrastis constituents, among which were several inorganic salts. Our study produced a colorless liquid, which we placed in the hands of a large number of physicians, who used it in practice and reported the results of their experience. Among them was Professor Roberts Bartholow, M. D., who investigated it both clinically and physiologically, and wrote as follows, allowing us to use his results for the profession's benefit:

"It is promptly absorbed, for the action begins in a few minutes after it is thrown under the skin of an animal. It affects the system and causes tetanic convulsions in one-half the time necessary for the official fluid extract to produce an impression, and it has about twice the strength of the latter."

This report of Professor Bartholow was supported by others, and at last, (1887), having great faith in its superiority, we quietly placed the preparation on our list of remedial agents, where, because it was colorless, it at once commanded much attention, no colorless Hydrastis liquid having ever before been offered. Then came a great demand for Lloyd's Hydrastis. Its reputation increased continually. Physicians found it to act promptly and admirably; but yet, as at first presented, it was subject to some faults. The toxic qualities mentioned by Professor Bartholow (corroborated also by others) as being prominent in the experimental specimen, were overcome by a careful and extended detail study resulting in the balancing of the proportions of the ingredients. A slight irritating quality, also inherent in the first form, was likewise the subject of study and correction. Nature seldom presents the best arrangement or proportion of plant constituents for man's use, in any direction where a crude drug is of value. This is particularly true of Hydrastis, which contains such varied structures and such antagonistic ultimates. Lloyd's Hydrastis seems finally to be perfected. No complaint is now ever heard concerning its qualities or its effects. In its field of action the preparation is accepted as invaluable, and it apparently needs no further study.

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Special Use of Lloyd's Hydrastis.—Before the introduction of Lloyd's Hydrastis, decoctions and other preparations of Hydrastis had long been valued in the treatment of gonorrhea. But the intense yellow color and irritating qualities, due largely to the irritating alkaloids, as well as the variations in commercial preparations, made these objectionable alike to physician and patient. When it was discovered that Lloyd's Hydrastis carried all the useful qualities of the drug, without the objectionable features of other remedies used in treating gonorrhea, a demand arose among physicians needing such a remedy, which led to its extensive use in the treatment of that "unclean" disease. In the practice of thousands, Lloyd's Hydrastis is now by the testimony of physicians the most relied upon, safe, kindly, and sure remedy for this ailment. In this connection we call attention to the fact that, in common with all our products, it is designed for professional use only, and is distributed only through apothecaries. No remedy for any purpose whatever made by us is sold to the laymen or advertised to the people.

When the remedy attained its reputation, and long thereafter, gonorrhea was considered a trivial disease in men, and of no serious concern to women. However, within a few years, the leaders of the medical profession have been appalled, not only by the serious complications now proven to result from this disease in women, but also at its prevalence in various complications in society. Of these facts physicians of the past were in ignorance. The necessity for a comprehensive understanding of the ailment has induced us to arrange with Dr. George F. Butler for a special article to accompany this Drug Treatise on Hydrastis. This paper of Dr. Butler's is of the utmost importance, and every physician should carefully read the statements contained therein.

GONORRHEA.

Its Dangers to the Individual and to Society.

By GEO. F. BUTLER, M. D.

Professor and Head of the Department of Therapeutics and Professor of Clinical Medicine, Chicago College of Medicine and Surgery, Medical Department Valparaiso University, etc. Author of Butler's *Materia Medica*, etc.

The Name. Gonorrhea is the most venereal of diseases, dating back to the beginning of history, and originating, doubtless, in uncleanness. Bransford Lewis says, "As a direct cause of death, syphilis ranks far below gonorrhea, although the contrary is, no doubt, the current belief of most people." I. J. Weston says: "Gonorrhea is the most dangerous of the venereal diseases, for

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through the medium of its sequelæ and complications, it causes more deaths than syphilis. By comparison, chancroid is benign. Subtract the evil effects of gonorrhea from human ills, and the resulting increase in human longevity and happiness would be surprising." The term "gonorrhea" is a misnomer, since it implies a morbid discharge of semen (*γόνι*, semen, and *ρεῖν*, to flow), as well as a disease of specific and unvarying character. A better name for so-called gonorrhea would be, "infectious" or "specific urethritis," indicating an urethral inflammation characterized by the presence of the gonococcus.

Cause and Origin. It should be remembered, however, that a woman may contract true gonorrhea from a man suffering from a urethritis where the gonococcus can not be found. In such cases one of two things is certain, either the germ was present, undiscovered, somewhere in the male genito-urinary tract, or certain innocuous germs implanted on a different, or filthy surface, became virulent. I am thoroughly in accord with Lydston, who says: "The development of the gonococcus—and, indeed, of all germs capable of producing infection—has probably been along evolutionary lines. We can not accept, neither can we disprove, the possibility of the spontaneous generation of germs, of either indeterminate or specific type. The possible transformation of innocuous germs, by adaptation to environment, into germs of a specifically-pathogenic character, is, however, scientifically plausible enough. The female generative apparatus constitutes a most favorable environment for the development of germs, and the acquirement of pathogenic properties by them. Protection from air and light, and the presence of heat, moisture, and decomposable secretions of various kinds, constitute conditions highly favorable to bacterial evolution. Pathologic discharges and exposure to local irritation constitute an additional and important factor. In uncleanly women, vaginal discharges, as well as both pathologic and physiologic discharges from the male, are allowed to accumulate and undergo decomposition. The semen is a highly complex organic substance, the decomposition of which in all probability results in the development of highly irritating toxins. Whether or not the gonococcus be accepted as the unvarying cause of a specific type of urethritis, the fact remains that the environmental conditions that have been mentioned are the point of departure of germ evolution, the products of which are infections capable of producing mucous inflammation of varying grades of severity, ranging from simple urethritis to virulent gonococcic inflammation."

Complications. There are many varieties of both acute and chronic urethritis. In this paper, however, I shall consider only that form which is characterized by the presence of the gonococcus discovered by Neisser, of Breslau, in 1879. Experiments have proved unquestionably the pathogenic character of the gonococcus. It is invariably found in the purulent discharge of a true acute gonorrhea. The germ may also be found in the muco-purulent discharge and threads of many cases of chronic and subacute urethritis; in gonorrheal discharges from the vagina, uterus, conjunctiva and rectum; and gonococci have been found, in a few cases, in the secretion of the mucous membrane of the mouth and nose. The presence of the micro-organism has also been demonstrated in peri-urethral folliculitis and abscesses, in gonorrheal rheumatic joints, in suppurating vulvo-vaginal, inguinal, parotid, and other glands. It has been found in endocarditis, tendo-vaginitis, acute diffuse peritonitis, pleurisy, and in other inflammations developing during the course of gonorrhea, showing that the gonococcus readily enters the blood, producing metastatic infection of other organs.

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This metastatic infection is much more frequent and serious than it is commonly believed to be. Bujivid, Jundell, Horwitz, Weiss, and others have reported cases of severe gonorrheal affections of bones and cartilages in patients suffering from gonorrhea.

Gonorrheal rheumatism, so called, is a very common complication of gonorrhea. It must be considered as septicemic, and occasionally as a part of a severe septicopyemia. König believes it is the most common disease of the joints, and according to Damasch, it develops in from 2 to 3 per cent of all gonorrheal infections. Lucas reports 18 cases in which the primary infection was gonorrheal conjunctivitis. Smith reports a case of gonorrheic arthritis of the knee in an infant fourteen days old, afflicted with ophthalmia neonatorum. Acker cites a case of multiple arthritis in a girl two years old, afflicted with gonorrheal vulvo-vaginitis. Poncet, Lapersonne, Clement, Deutschmann, Lindemann, Hock, and others have described joint lesions of this nature in infants suffering from purulent conjunctivitis. Any one, whether man, woman, child, or infant, may develop gonorrheal arthritis from a local gonorrheal infection.

Gonorrheal Rheumatism and Eye Complications. Gonorrheal arthritis is a serious complication, or phase of gonorrhea, as it is essentially chronic, sometimes relapsing, and is often marked by complications, such as atrophy of contiguous muscles, ankylosis, and iritis. Indeed, Gorffith believes iritis to be a more frequent complication of gonorrhea than of syphilis. The affections of the eye in gonorrheal rheumatism are comparatively common, and take the form of conjunctivitis or scleritis, and iritis. Fournier met with ocular lesions in fifteen out of thirty-nine cases.

Cardiac Lesions, etc. While cardiac lesions are not as common to gonorrheal as to true rheumatism, they nevertheless occur. Gluzinski, who has collected thirty-one records of cardiac lesions associated with gonorrheal rheumatism, suggests that the endocarditis, when it occurs, is rather of the ulcerative than of the simple type; and a considerable number of cases are on record in which death has resulted from endocarditis, undoubtedly of the infective variety. In "exceptional cases, cicatrix, permanent arthritic changes resembling arthritis deformans, exhaustion psychosis, or multiple neuritis, develop during the course of gonorrheal rheumatism."

Garrol says that in some instances in which the vertebral joints are involved, symptoms due to implication of the nerve roots are observed, and there are a few cases on record in which spinal symptoms amounting in some instances to complete paraplegia, have appeared without any recognizable local cause. Some of these cases have ended in recovery, and in others which resulted fatally no post mortem examination was made. Leyden has recorded a case in which meningo-myelitis was found at the autopsy, and Dr. Gowers describes one in which acute ascending myelitis followed close upon an attack of gonorrhea.

Other Results of Gonorrheal Infection. We are all familiar with the complications so often found in the case of a man suffering from gonorrhea.

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rhea, epididymitis and orchitis, acute and chronic prostatitis, with all their distressing symptoms and danger of abscesses and sepsis, vesiculitis, cystitis, pyelitis, folliculitis, periurethritis, cowperitis, lymphangitis, adenitis, stricture with its discomfort, retention of urine and all its varied symptoms and ill effects, balanitis and balanoposthitis, to say nothing of gonorrheal rheumatism already mentioned, and gonorrheal conjunctivitis, with its intense pain and violent symptoms generally. The prognosis here is very unfavorable, as the affection often results in involvement of the cornea, and partial loss of vision. Add to the above impotence, shattered nervous systems, and sterility (it is estimated by competent authorities that 42 per cent. of gonorrheics become sterile, and 50 per cent of all sterility is due to gonorrhea), and we get some idea of the terrible nature of the disease.

Finally we have as additional sequelae of gonorrhea, various skin affections like urticaria, erythema nodosum, and hyperkeratosis. One has only to read the writings of Schneider, Hoffman, and Sturgis, to learn of the innumerable affections consequent to metastatic gonorrhea. The far-reaching consequences and complications of gonorrhea make an impressive appeal to the medical profession to do all in their power, by education and by treatment, to check the spread of this malady.

Effects on the Nervous System.—The effects of gonorrhea upon the nervous system are appalling, being as serious and almost as protean as those of syphilis. Such men as Charcot, Christmas, Selleneu, Leyden, and others have shown that the gonococci and the gonotoxins are powerful poisons to the nervous system. "Orlipski," quoting from Weiss, "describes gonorrheal neurones; Kienbock and Ware report blennorrheic neuritis, and myositis; Glynn and Kankarovitch, besides multiple neuritis, describe paralysis as a complication of gonorrhea, and Welanders observed a fatal case of polyneuritis due to gonorrhea."

In my own experience I have observed most distressing instances of hypochondriasis and even of melancholia, resulting from prostatitis and stricture, due to gonorrheal infection. The profound mental depression, the neuralgias and pain, the nervous irritability, the general mal-nutrition and malaise, the restlessness, fears, and anxieties tell only too eloquently of the dire effects of gonorrhea and its complications. I have had both men and women under my care suffering from that unfortunate condition known as "neurasthenia," who had all the distressing, vague, varied, and numerous symptoms characteristic of this disease, among the more prominent being profound mental depression, irritability, hypochondriasis, nosophobia, neuralgias, tingling sensations or numbness, constant weariness and weakness, aching pain in the back and legs, sleeplessness, hot and cold flushes, dull, tired feeling in the head, headache, loss of memory and inability to concentrate the mind upon work, fitful appetite, indigestion, constipation or alternating diarrhea, loss of weight, etc. And all these, and other symptoms of impaired health, could be traced, directly and primarily, to a gonorrheal infection.

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But the most deplorable and pitiful effect of gonorrhea, perhaps, is the serious and often lasting damage done to innocent women and children.

Among the most dreaded complications of gonorrhea is opthalmia neonatorum. Fully 80 per cent of all blindness originates in gonorrheal infection of the eyes during parturition, not to mention the number of such infections of the eyes that occur in adult life.

Appalling Results in Gynecology.—The science of gynecology allows us to watch the effects of contagion, from the vulva to the abdomen, and, in section of that complicated apparatus, recognize the gonococcus and testify to the damage it does. It creates acute or chronic purulence throughout the whole extent of the genital canals, even to the depth of the abdomen, and that too without being assisted by violence, fatigue, or excess of copulation, but by the sole fact of its progressive migration. It produces swelling of the mucous surfaces, with a consequent gumming up of the Fallopian tubes with permanent sterility, distension and displacement of the organs with loss of their functions, and possibly, an alarmingly rapid fatal result unless surgery intervenes, or a hopelessly chronic condition, which means the ruin of a life. Gynecologists estimate that from 60 to 75 per cent of their operations, chiefly upon married women, are made necessary through gonorrhea. Joseph Tabor Johnson says: "The effects of gonorrhea on the female generative organs have been so destructive, that no successful contradiction is feared when the belief is expressed that no disease in modern times has caused so much indirect mortality, mutilation, and suffering, both mental and physical, as gonorrhea." Matthew D. Mann says, "Practically every case of pus tube is of gonorrheal origin." Joseph Price says that 95 per cent of his abdominal sections for pelvic inflammation were from gonorrheal infection. Prince A. Morrow says that 70 per cent of all the women who presented themselves for treatment at the New York hospital under his observation "were respectable married women who had been infected by their husbands." The more carefully we study pelvic diseases in women, the narrower their etiologic field becomes, and the more frequently they are found to be dependent upon gonorrhea. Thus, when freed from pathologic and anatomic errors, pelvic inflammations are found to be dependent, in the majority of cases, if not all, upon tubal disease, and tubal disease is, unquestionably, almost always due to gonorrhea and its congeners or derivatives.

Byron Robinson says: "It is my opinion that in 95 per cent of nullipara, pyosalpinx is of gonorrheal origin."

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In the vast majority of nullipara afflicted with pyosalpinx, or in those who have suffered abortion, the disease is of gonorrheal origin.

In 95 per cent of subjects possessing established bilateral pyosalpinx it is of gonorrheal origin. The oviducts may become attacked at different periods of time.

The clinical history is the only definite method of determining the character of the original infection of the oviduct.

The presence of streptococcus in an oviduct, in the absence of a history of puerperal infection with the history of gonorrhea, is not an indication that gonorrheal germs were not responsible for the original primary infection.

Ninety-five per cent of gonorrheal pyosalpinx eventually presents itself in the opposite oviduct.

The vagina is not, primarily, readily subject to gonorrhea, an immunity probably due to the absence of glands in which the microbes may find a nidus. Thus the gonococcus at first finds a habitation in the mucous follicles at the orifice of the urethra or vagina, or in the sinuosities of the uterine cervical glands. When thus affecting the urethra, an irritation arises which induces a cell proliferation, suitable for successful attack by streptococcus and staphylococcus, present in the infecting matter. Thus suppuration results, which in combination with the gonococcus, travels up the urethra to the bladder, producing cystitis. Should entrance to the ureters be effected their inflammation ensues, and by consequent contraction in healing, their stricture and hydronephrosis. If progressive to the kidneys, their inflammation and perhaps suppuration leads to pyonephrosis. Also, the canals of the vulvo-vaginal glands may likewise be primarily affected by the infecting gonorrheal matter, and abscesses in them occur. The vagina is thus continuously exposed to the disease, and becomes infected; and presently, especially if the os uteri gape, the cervical canal,

Or the gonorrheal matter, in union, may be directly injected into the canal of the cervix, and take up a habitation in the gland ducts; and the vagina be secondarily infected by the downward passage of the diseased secretions. From the cervix the corporeal endometrium is affected, and the gonococci may infect the sinuosities of its gland tubes. Thus, should the vagina, vulva, and urinary canal have recovered from the disease, perhaps by treatment, a later downward passage of the germs may again infect the vagina; hence vaginal recurrence.

The trumpet mouths of the Fallopian tubes render it easy for the germs to enter and infect them. Hence, salpingitis and the evolutionary affections of the peritoneum and ovaries, with consequent sterility.

From a gonorrheal infected Fallopian tube may result ovarian abscesses, pyosalpinx, and septic peritonitis.

The Wreckage of Womanhood and Family.—It is agreed that many writers, among whom I may mention Hunter, Ricord, Gaillard, Nonat, and especially Bernutz, knew the progress of gonorrhea, and described its effects on the Fallopian tubes and the ovaries, but the first to show the dangers of gonorrhea was Noeggerath, who in 1872 published his first pamphlet, in which he declared that latent gonorrhea in man was the cause of sterile marriages. Said he: "Soon after marriage women suffer from painful courses, whites, frequently make water and with difficulty, feel a weight in the lumbar regions, and finally have periuterine inflammation and ovaritis. These are caused by the latent blenorhea of the

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husband, which is transmitted to the young wife in either an acute or chronic form." And he adds, "90 out of 100 sterile women have for husbands men who at one time in their life had gonorrhea."

Vedeler investigated 310 sterile marriages, and found that 75 per cent. of them were directly or indirectly due to gonorrhea in the husband. As a prolific cause of so-called race suicide, voluntary abortions are as nothing when compared to this. The supreme object of marriage is defeated. This accursed disease lurking, as it often does, under the floral tributes of the honeymoon, may so inhibit conception or blight its products, that motherhood becomes either an utter impossibility, or a veritable curse. At the marriage altar rarely does love contemplate a future like this. The thought of motherhood illumines the silent meditations of the bride: the dream of being called "father" lifts into heroic attitude the happy groom. In Amiel's Journal I find the following: "The ideal which the wife and mother makes for herself, the manner she understands duty and life, contain the fate of the community. Her faith becomes the star of the principle that fashions the future of all belonging to her. Woman is the salvation or destruction of the family. She carries its destinies in the folds of her mantle." Less poetic, but more truthful would be the paraphrase: "To the absence or presence of the gonococcus is due the salvation or destruction of the family. Its destinies are carried in the folds of the genital tract."

It is common to hear women who suffer continually from nervous and "female complaints" employ such words as these: "When I was a young girl I was quite well. It is only since marriage that I have become ill." Every day this confidence, this plaintive refrain, saddens the doctor. It is continual and inexorable. From the discolored and suffering faces we may guess a whole past of debility. And the origin is always marriage. The husbands have a quiet conscience, they go about their business or to their clubs, create fresh pleasures or new relations for themselves, and desert the mournful marriage-bed. They can reckon on every sympathy, for who does not pity them for having married wives with such bad health? We must put a stop to these distressing situations. All we doctors must make a crusade against this hidden enemy, many times more terrible than syphilis, as some of the ablest specialists in the world have said. Let us declare that we can never sufficiently impress on young men the ultimate consequences of gonorrhea; let us show them plainly their future married life poisoned, their posterity compromised; let us give them the means to recognize this evil; let us appeal to their honesty, their good sense, and their interest, to avoid all approach to this evil, or if contaminated, to avoid marriage; and, above all, let us learn how to cure them. This duty is needful, both for the happiness of individuals and for the preservation of society.

Pathetic Examples.—And miserable to relate, this disease is met with even among little girls. A young girl may contract it primarily from a man who had the idea that his gonorrhea was curable by contact with a young virgin; and she may convey it to others by the fingers. It may be contracted by other means, as

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by contact of the vulva with gonorrhea-infected towels, closet seats, or chamber utensils; but, whatever the sex or age of the patient, there has been direct contact with the discharge of a previously diseased person. It is terrible to think what contagion a woman who is a wife and mother, and who has not been sufficiently warned, may spread around her in the narrow circle of a small household. It has been clearly proved that among young girls affected with vulvitis, many had acquired the gonococcus through sharing their parents' bed. These innocent blennorrhoeas are far from inoffensive, and are all the more dangerous for being treated badly, or not at all. These young girls, perhaps but of a few years of age, may retain the disease for many months or even years, during which it is liable to advance into the higher genital organs, and produce evolutionary results. In this way it may be a common cause of the peritonitis of female childhood, and of adhesion and arrest of development of the genital organs, perhaps with their displacement. Of the latter results, a small, adherent, retroverted uterus and adherent, atrophic ovaries, may be subsequently apparent, as having occurred during the years of childhood.

Vitality of the Gonococci.—"How long may the germs of gonorrhea be carried in the system?" is a question often asked. We are astonished that organisms which have remained harmless in an individual for months, often for years, should prove so terrible in their transmission. Nothing is more logical, however, nor better proved by what we know concerning the functions of these germs, passing from a worn-out field in which they have been attenuated, to virgin soil. In our own "cultures," when they are about to perish, they may be revived by a little fresh bouillon or jelly. Nor must we overlook the influence of the innumerable organisms, the generally inoffensive inhabitants of the female mucous membranes, which are capable of preparing the development of their dreaded congeners, and even of co-operating with them in their mischievous work. However that may be, in the conjugal act the inert germs meet the soil they require, and are deposited there under wonderfully favorable conditions of receptivity. It would be difficult for them to remain inactive. Their vitality is restored, the seed is sown, and the succeeding generations soon bring the virus to its maximum of intensity. Then comes the acute stage for the young victim; but it must not be forgotten that she, in her turn, can transmit to her husband the reinforced principle she has received, and that he himself will be struck by the disease of which he was the cause.

Diday laid down this axiom as early as 1881: "Whether she has ignored her malady or whether she has treated it, a woman who has once had blennorrhoea remains for a very long time—in some cases I might say perpetually—a source of contagious secretions: a source all the more prolific because it is deep, concealed, and above all intermittent." Guérin relates the instance of a widow who had caught gonorrhea from her husband, and three years after his death—three years which had passed in chastity—contaminated a man with whom she was in love.

Noeggerath believes that a man never fully recovers from his first gonorrhea, and claims that nine-tenths of all women married to men who have had gonorrhea, eventually become sufferers from some form of pelvic inflammation. Hyde and Montgomery say that it is not safe for a man to resume sexual relations within

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six months after his acute gonorrhea is apparently well, unless he has been subjected to proper tests. Regarding the infectiousness of chronic gonorrhea they say: "It is evident that with a chronic urethritis in the secretion in which gonococci are present but occasionally, a man may indulge in sexual intercourse repeatedly without infecting his partner, though he has no means of knowing at what time his discharge may become infectious. It is not safe, therefore, to allow a man with chronic urethritis to marry, or, if married, to resume marital intercourse, until after several frequently made examinations, the discharge shows no gonococci, and the clinical symptoms point to the presence of nothing more than a catarrhal discharge." Finger says: "I permit a patient who is suffering with chronic blennorrhea—that is, the morning drop or clap-shreds—to have marital intercourse only after I have convinced myself, by a two to four weeks' daily examination of the secretion or clap-shreds, that they contain only epithelium, and no pus cells, and when after irrigation of the urethra with a solution of silver nitrate or corrosive sublimate, and consequent suppuration, the secretion is entirely free from gonococci, and there is no further indication for the continuance of treatment. The conditions which I require are, accordingly, the absence of gonococci, pus-corpuscles, and periurethral complications."

While most authorities think Noeggerath's views are extreme, they all unite in the opinion that gonorrhea is both active and contagious for an indefinite length of time, only ceasing in these respects when the organisms are killed out. We may go further and ask ourselves if, independently of the gonorrheal virus, the *goutte militaire*, which is always more or less rich in microbes, can not, with the assistance of the common pyogenesis starting the infection of the utero-ovarian apparatus, open the door to all the terrible complications of puerperal fever. Puerperal fever is rare, and we can not fail to be impressed, therefore, when our patients make remarks similar to those quoted by Jullien:

"I was married eight years after my first clap, and I believed myself perfectly cured, when two months later I suffered from a white running which soiled my shirt."

"And was your wife ill?"

"Oh no, she never knew anything about it—thank God!"

"But now?"

"Alas, doctor, I lost her. She died of puerperal fever after her accouchement, the year we were married."

Deplorable Effects on Women.—A persistent morbid condition, with no tendency to get cured, is most often established. Little by little the genital apparatus is entirely involved, the general health is debilitated, all the functions are enervated, and the poor women drag about, paying by a long fatigue for a moment's pleasure, or a little neglect of health, or a long walk.

The home is without children, and all gayety has vanished. And this condition may last for years. Such women are more to be pitied than those who have been carried off by rapid disease.

Diagnosis.—To a careful physician the diagnosis of acute or chronic urethritis, or the distinction between an exacerbation of a chronic urethritis and a recent mild infection, is not difficult; but thorough and careful examinations must be made, and no reliance should be placed upon the mere statement of the patient that he has a "running" from the urethra. Nor is it sufficient merely to look at the discharge. Sometimes gonorrhea in women is revealed only by remote complications. From this point of view, rheumatism, so frequent among young

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married people, and under the most varied forms,—acute, subacute, monarticular, or polyarticular, and that which was formerly called genital,—is now shrewdly suspected by us. There is only one sure remedy, namely: chastity in man from childhood to marriage.

Superficial Examination of Prostitutes Useless.—Regarding the examination of prostitutes for suspected gonorrhea, Dr. Valentine of New York says: "Systematic examinations of their genitals, even twice daily, would be of no avail, for between two such examinations a prostitute could easily infect twenty men. Moreover, those who would conscientiously examine a female for gonorrhea alone, know that it can not be done in less than ten days." But I have neither the time nor space to go thoroughly into the details and minutiae of the diagnosis of this disease, my aim being to call attention to its complications. Neither shall I, in this paper, discuss the subject of treatment, being content to limit myself to the following important general considerations.

Popular Fallacies and General Remarks.—Contrary to the popular belief, gonorrhea, with its protean and serious manifestations, is a very difficult disease to treat satisfactorily.

The common opinion that gonorrhea "is no worse than a bad cold," that it is easily cured by some ready-made, shot-gun prescription recommended by the druggist, barber, or some afflicted friend; that the disease is cured when symptoms subside and discharge ceases; and that "curbstone advice" is of any value whatever in these matters, should all be confuted as energetically and as rapidly as possible. As Bransford Lewis remarks, the disasters to which they lead are inestimable. The mercenary motives of quacks and charlatans should be exposed, and their villainous teachings rejected. He also says, very truly, that the majority of physicians, as well as the people, set too low a standard of requirement on the term cure. They look on the absence of discharge and of active symptoms as indicative of recovery, when as a matter of fact these form very poor testimony to that effect; there may be abundant gonococci in a posterior urethral or seminal vesical inflammation, without any outward evidence whatever. It is, indeed, just such cases that lead the infected individual into making the disastrous mistake of considering himself cured, and of having intercourse with a confiding female and spreading the contagion, whereas, if he had an active discharge, he would not think of doing such a thing. Moreover, the person who treats himself on this plan—of trying merely to stop the discharge—is the subject of an endless number of recurrences, which he may interpret as new cases, and consider himself wonderfully successful

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in curing them in a few days, with his sure-cure prescription; while, as a matter of fact, he never cures any of them. He merely stops the discharge, but remains as potential as ever for the dissemination of the disease, and for its recurrence in himself. "A remedy for self-administration that will cure the majority of cases, even in from three to six weeks, will be hailed as one of the greatest discoveries of the age," says Lydston.

Noeggerath has said, "Once a gonorrhea, always a gonorrhea," and the noted Ricord said, "Anybody can tell when a gonorrhea begins, but God alone knows when it will end." With increased knowledge of therapeutic methods, modern clinicians are, however, more optimistic regarding the curability of this disease. But no one, however, should undertake the treatment of gonorrhea save a physician who is thorough, skillful, painstaking, and who fully appreciates the gravity of the disease, its serious complications and disastrous sequelae.

Publicity Needful. Society Must Be Instructed.—Physicians, first of all, should be educated along the line of duty, and then, through them, the public should be informed of the loathsome nature and disastrous results of this and other venereal diseases. Publicity regarding this matter is urgently needed. Dr. Prince A. Morrow has well said, "Venereal infection stands as the prototype of evils made possible by the ignorance of the public. Venereal disease is not confined to the terrain of prostitution where it originates—it spreads beyond the purlieu of vice, and invades the habitations of virtue;—even the sanctuary of marriage affords no safeguard against its soilure. It collects about the very sources of human existence; it pollutes the fountains of life; it befouls the sacred function of maternity; its defilement clings to the innocent infant ushered into the world. It is especially needful that the muck of venereal infection should be cleared away from marriage, the breeding place of humanity, so that the springs of heredity may be kept pure, and children no longer be deprived of their rightful heritage of vitality, health, and vigor. The public should know that the introduction of venereal infection into marriage constitutes its chief social danger, and at the same time makes up the saddest chapter in the martyrdom of women."

We must exert ourselves to the utmost to stamp out this scourge, more to be dreaded than smallpox, more far-reaching in its effects even than tuberculosis or than syphilis. I am fully in accord with Burr, who recently said, "It is a disgraceful anomaly in state medicine in the United States of America, that the most persistent of all contagions, the most prevalent of all excepting measles, the most costly and dangerous of all in the aggregate, barring none, should have no official existence. The day must come when the suppression of the gonococcus shall rank in sanitary importance with the destruc-

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tion of the mosquito; when the culture beds of the "red light districts" shall be looked after as carefully as the drainage of stagnant and polluted waters."

Caution.—Let it be remembered that the virus of Gonorrhea is likely to cause the disease by contact, in the innocent as well as the guilty. And let it also be remembered that towels infected by a touch of this unclean virus, brought into contact with any mucous membrane, such as the eye or elsewhere, may also prove infectious. Nurses in hospitals must be very careful. Physicians having Gonorrheal cases in families and in hospitals, must make a point to urge upon the attendants and upon the members of the family, that the afflicted person is likely to infect others. For this reason, such articles as towels and bed linen must be kept separate from those used by the family or by nurses, and, in fact, every precaution taken by advice, even though the name of the disease be not made public, to prevent innocent persons from becoming infected. For like reasons, travelers and persons visiting public places, must be careful regarding the use of towels employed by others in a public way.

The Only Sure Preventive, "Be Thou Clean."—In conclusion I will say, regarding prophylaxis, that there is no drug, device, or other method which will insure against infection an individual who indulges in promiscuous sexual relations. **The only Prophylaxis is clean living.** The young man should deny himself the gratification of his sexual appetite until he is capable of union with one woman, and of providing for the support of a family. As Hyde remarks, the youth should be informed clearly that during a young man's period of sexual probation he has a constant conflict to wage between his passions and his better self, from which conflict he should emerge a victor. **The best of fathers and husbands are veterans of such conflicts.**

This exceptional treatise of Dr. Butler lucidly teaches the necessity of care concerning both the treatment of the patient and the protection of others likely to be infected by the virus of Gonorrhea.

Dr. A. F. Stephens, of St. Louis, has prepared for this Treatise the following comprehensive study of Gonorrhea, in relationship to its treatment. This, together with the article of Dr. Butler, and our historical portion, makes our Treatise on Hydrastis second in importance to no other member of the series.

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Gonorrhea, its Treatment and its Cure.

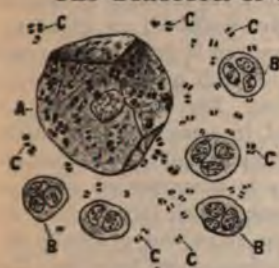
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Origin of Gonorrhea.—Although this disease has its origin somewhere in the remote ages, being long known under the old Saxon term *Clap*, it is only in very recent years that it has been scientifically studied and its true cause identified by Neisser (1879). He demonstrated that the pus and purulent cells discharged in gonorrhea contain a characteristic growth called by him *gonococcus*, and that only mucus containing this peculiar bacterial growth is capable of communicating the disease. He also proved that all mucus containing the *gonococci* is capable of transmitting the infection.

The Gonococci of Gonorrhea.—These minute germ cells may readily be



The Gonococci of Gonorrhea.
C—Gonococci; B—Pus Cells
A—Epithelial Cell showing the
Gonococci inside.

seen by means of a five hundred power microscope. To prepare the slide, dry a thin layer of gonorrheal mucus on a cover glass, by rapidly passing the glass a few times through a spirit-lamp flame, the film side up; then stain the dried film with a strong aqueous solution of methyl violet, and gently wash away the excess of coloring matter, by means of distilled water. Mount the cover glass with glycerine, and the gonococci may be plainly seen arranged in groups of pairs separated by a fissure, each individual being kidney-shaped.

Gonorrhea in Men and Women.—Owing to the unhappy prevalence of the view that the moral laws are unequally binding upon the sexes, they are too often broken without restraint and repeatedly by men who thus carry the infection to women and become infected in return by their victim. Until recent years gonorrhea has been considered essentially a "man's disease," of little consequence to men and less to women, and its treatment, with the most deplorable results, has too often been entrusted to the ignorant and the charlatan. In both sexes, unfortunately, the disease *apparently* yields readily to treatment, but to many who consider themselves "cured," a microscopical examination would show a most highly infectious mucus.

Since the early manifestations of gonorrhea are more apparent in the male than in the female, and since in its early stages there is a greater degree of suffering in the male, in whom, also, there is a possibility of resulting stricture which is absent in the female, the tendency in the past has been to treat the matter of gonorrhea in women as of small importance, and pass it as a disease easily cured by almost any haphazard method. Indeed as a matter of fact, only a few years ago gonorrhea in women was considered of so little importance as to receive only a passing notice in standard works on genito-urinary diseases. Because in the primary stages women do not suffer as much as men, and because in women the symptoms are more masked and the progress of the disease is more insidious, it was assumed that gonorrhea was insignificant as affecting women, particularly as the symptoms ordinarily presented yield readily to treatment,

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In this very fact, however, lies the greatest danger, since frequently the damage, because of its dormant ravages, becomes irreparable before its presence is even suspected. While the true cause of the evil remains entirely hidden, the woman is passing, too often, into the hands of the surgeon.

Although the early symptoms are so much more pronounced in the male than in the female, if the remote and appalling effects on the entire reproductive apparatus of women are taken into consideration, it will be seen that perhaps no other disease can be compared with it in its destructive after consequences, which are of so grave a nature as to demand early, radical, and continued treatment, until all possibility of infection is removed.

Course of the Disease in the Male.—Gonorrhea manifests itself to the male patient in from five to seven days after the infection. In exceptional cases, the time is shorter or longer, and good authority states that cases are known which develop in twenty-four hours to fourteen days; however, five to seven days is the usual time. At first a slight prickling, teasing sensation is noticed at the orifice of the glans penis, which in the course of a day becomes so intense as to be exceedingly unpleasant. The lips of the orifice swell and are glued together with a slight viscid secretion. Thus far the urethra is dry. The second day a milky white mucous discharge appears, at first in small quantity, merely a drop at the end of the gland, afterwards more profuse. For several days this discharge becomes more abundant, thick, yellow, and in some cases greenish. It dries on the linen with a stiff, yellow stain, and is liable to soil both the underwear of the patient and the bed linen. This discharge is accompanied with inflammation of the soft tissue of the penis, which becomes much larger than its natural size. After a week the disease passes its acute stage, and gradually decreases in intensity, whether treated or not. The inflammation subsides; the discharge lessens, and the patient, much encouraged, imagines he will recover without the aid of medicine. Such, however, is rarely the case, for, on the contrary, the discharge usually continues indefinitely, to finally become chronic, developing into what is called gleet, which is more serious, very painful, and much more difficult to cure than gonorrhea. The fact that gonorrhea is not at first a painful disease, often leads to disastrous neglect. In many instances, the only actual pain experienced is in the passage of urine, and in chordee.

Chordee.—This is said to be the most painful sensation connected with the disease, but it does not prevail in all cases, some afflicted persons having it rarely and mildly, others often and severely. It is caused by the stretching of the inflamed erectile tissue, due to the erection of the penis during sleep. The pain is sudden and severe, and the patient often springs from bed in a sudden paroxysm of pain. Temporary relief is usually found by inserting the penis in a basin of cold water, which relaxes the tissue. The pain is, however, apt to recur again under the influence of warmth, as soon as the patient has returned to bed and fallen asleep. This may recur several times during the night. Patients should be cautioned against forcibly "breaking the chordee," by straightening the penis by force, as this practice is liable to cause hemorrhage and consequent stricture. A pill of camphor, one grain, and opium, one-half grain, taken before retiring, or a dose of five grains of potassium bromide, will have a tendency to allay the excitement, and prevent this recurrence.

Acid Urine.—The passage of acid urine through the inflamed male gonorrheal urethra causes a hot, scalding pain, that to the patient is usually a severe ordeal. It can be mitigated by the administration of mild alkalies internally.

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Half a teaspoonful of common baking soda dissolved in water should be drunk before each meal, and the urine should be tested with litmus paper until it becomes nearly neutral. When this occurs, the soda should be discontinued.

Course of the Disease in the Female.—The disease first attacks the orifices of the urethra and vulva, and not until well established does it infect the lower vagina, from whence it creeps upwards, infecting the cervix, the uterus, and Fallopian tubes, spreading possibly to the ureters and the kidneys, with the most distressing results. By reason of these complications and its insidious progress, it results that the disease, far from being more easily combated in the female than the male, as was formerly the view even of specialists, is now considered much more serious in women than in men. When we take into consideration the extent of surface and the multitudinous folds of the vagina wherein the gonococci may hide, escape destruction, multiply, and from thence pass through the cervix into the uterus, where they set up an endometritis, and eventually a salpingitis, it is not difficult to see that the utmost care must be used to eradicate (early) the specific character of the disease in the woman's affected genital organs. Furthermore, after the more remote organs have become affected, there is a strong liability of reinfection of the vagina, even though the more easily reached parts have yielded to treatment. This is by reason of the downward passage of the gonococci from the parts still diseased.

In the early stages with women, the mucous membrane is congested, swollen, and tender to the touch. Secretion is lessened, and the parts are drier than normal. After secretion is re-established, it consists of a thin, transparent mucus, which changes rapidly to a very copious sero-purulent, creamy discharge. This discharge becomes very irritating, and is apt to cause inflammation of the vulva. In ten to fifteen days the acute symptoms—congestion, swelling, and pain subside, but the copious, muco-purulent discharge continues, which, if the patient is ignorant of a possible gonorrheal contact, is considered as a simple leucorrhœa, or "whites." Then at last come the terrible after-consequences so destructive to the female organs of generation.*

Concerning Treatment of Gonorrhea.—It has been asserted that, indirectly, gonorrhea causes more deaths than syphilis. In women, as has been said, the remote effects of gonorrhea are often of so grave and serious a nature that it can not be too strongly urged upon the physician to apply an early and vigorous treatment, to the very limit of possible infection. The disease must be eradicated before it affects the uterus and tubes, for it will then be beyond the reach of medicine.

With men, the chief danger arises not from the primary form of the disease, but from neglect or injudicious treatment, which brings on stricture or some other complication. From the nature of the disease, men are anxious to have as speedy a cure as possible. Since no physician permits sexual intercourse whilst the infection prevails, men too often importune the physician to stop the flow in a few days. Should the physician yield to such entreaties and inject a strong as-

* See article by Dr. George F. Butler, pp. (23 to 34).

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tringent, the flow is checked, but at the risk of a resulting stricture much more serious than gonorrhea, and excruciatingly painful. This quick (newspaper advertisement) treatment, however, is seldom now employed by the physician, who is aware of the risk attending it. Frequently, however, the patient does not, at the start, consult a physician, but surreptitiously injects one of the many nostrums advertised "to stop the flow in twenty-four hours." Or he consults some friend as ignorant as himself, with the same distressing termination. No person afflicted with gonorrhea should ever attempt self-medication, but should at once consult a skillful physician. For while it is true that some persons have used such remedies with apparently good results, and no apparent harm has followed their use, as a rule these astringent "quick cures" do irreparable damage, which in after years proves destructive to the health, (especially with women, even sacrificing the life of the patient).

Preparatory Treatment.—When a case of gonorrhea is presented to a physician, the patient should be given a mild laxative, because constipation, which usually accompanies gonorrhea, very much aggravates the disease. The following prescription is useful:

- B. Fluid Extract Cascara Sagrada,
Simple Syrup, aa One Fluid Ounce.
Misce. Sig. A teaspoonful, increased if necessary, every morning for five days, or until the bowels move freely.

Moderate doses of epsom salt may be substituted for the cascara, with excellent results, as the effect of the salt upon the urinary organs is very beneficial, relieves pain, and subdues burning in the urethra. Then institute the

Antiseptic Course.—As a preliminary antiseptic treatment, the urethra is irrigated, first with normal salt solution,* to cleanse it, this to be followed immediately by injections of a 1 per cent. solution of lysol,† see page 42,) or a bichloride of mercury solution, (1-4000) or some other efficient, non-irritating, antiseptic.

If for any reason the remedies above mentioned can not be obtained, we may use any one of the following solutions: Asepsin, 10 to 20 grains to the pint of water; borax, $\frac{1}{2}$ to 1 dram to the pint; boric

*Normal Salt Solution. A teaspoonful of salt to the pint of water. The addition of $\frac{1}{2}$ ounce of Lloyd's Hydrastis is beneficial in treatment of gonorrhea.

†NOTE. Lysol. A mixture of alkali compounds of the higher phenols, with fat and resin-soaps, obtained by boiling a mixture of heavy tar oils, fat and resins, with alkalis. Used externally, for dressing wounds and injuries, for disinfecting hands and surgical instruments, and recommended as a destroyer of fungi and insects.—*Merck's Index*.

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acid, 2 to 3 drams to the pint; or permanganate of potassium, 10 grains to the pint of water. The object is to get clean and stay clean.

This cleansing process should be repeated every day for three days to insure that the surfaces are clean and the specific virus has been entirely destroyed. For several days following this the urethra should be washed out twice a day with normal salt solution* used as hot as can be comfortably borne by the patient.

Nothing ought to be done toward stopping the discharge until after the acute stages of the disease have passed; that is, until after six or seven days. During all this period employ also the following prescription once or twice daily:

R. Aqua Destillata,	- - -	8 ounces,
Bismuth Sub. Nit.	- - -	¼ ounce,
Lloyd's Hydrastis,	- - -	¼ ounce.
Misce.		

Sig. Warm to tepid heat and use from one-half ounce to an ounce of the mixture at a time as an injection. Shake before using.

The subnitrate of bismuth has a tendency to coat the folds of the canal and to mitigate the disease. At the same time the patient should be advised that the prescription is not intended to stop the flow of mucus.

Care Concerning the Discharge.—The male patient should be directed to supply himself with a bag to contain the penis, thus preventing the discharge from soiling the clothes and bedding, and from spreading the contagion. Bags manufactured expressly for the purpose, and known as "gonorrhea bags," are sold by the druggists, but an excellent substitute can be made by cutting off the toe of a stocking, which can be retained in place by pinning with safety pins to the drawers in such a position as to support the penis. The bag should be lined with absorbent cotton to catch and retain the discharge. When the cotton is removed, it should be burned. The patient should be cautioned strictly regarding the acrid and poisonous nature of the discharge, and instructed to cleanse his hands carefully after handling the affected parts, which can be readily done by thorough washing, the mucus being very soluble in water.† Every gonorrheal patient should be particularly warned **never to rub the eyes with unclean hands**, for if the mucus be accidentally introduced into the eyes, it causes the most distressing conjunctivitis.

* Normal Salt Solution. A teaspoonful of salt to the pint of water. The addition of ½ ounce of Lloyd's Hydrastis is beneficial in treatment of gonorrhea.

† Water carrying ten to twenty grains of Asepsin to the pint is desirable. Indeed, the water used in bathing the organs as well as washing the hands should be thus made antiseptic. For a description of Asepsin, the fragrant antiseptic, see pages 2-11 Drug Treatise No. VI.

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When to Begin Curative Treatment.—Gonorrhea in the male, as has been said, has a stage of about a week, sometimes longer, of acute inflammation, during which time, a week at least, nothing should be done to check the discharge, although the soothing, cleansing, sanitary treatment suggested should be exactly employed. Let me repeat that nothing causes as much consequent trouble in the male patient, (stricture, etc.,) as injudicious astringent injections during the inflammatory stage. When the discharge begins to lessen, the acute stage is over; then, and not until then, the specific treatment for stopping the discharge should begin.

A Bad Way to Stop the Discharge.—It is usually a very simple matter to **stop** the discharge of gonorrhea, and for this reason many persons, ignorant of the true nature of the disease, imagine themselves cured when the discharge is checked. Upon its recurrence, for it is but temporarily interrupted in such cases, they believe themselves to have been freshly infected. Again they apply the treatment formerly used, with a like result, for the discharge ceases again, and they consider themselves wonderfully successful in **curing the disease**. "No worse than a bad cold," say they. As a matter of fact, the real evil has not been touched, for the patient has, during the whole period, been in a highly infectious condition.

Any astringent, as sulphate of zinc, acetate of lead, or tannic acid, injected even in an acute case of gonorrhea, will **stop the discharge** in a few days. The many nostrums advertised in newspapers to "stop the flow in twenty-four hours," are usually merely simple astringent solutions, and their venders thus approximate the truth in this statement. But the injection of such astringents into the canal congested by the disease, will, in perhaps a majority of cases, cause such sudden constriction of the tissue as to result in rupture, very slight and perhaps unnoticeable, it is true, but still enough to be followed, almost invariably, by a stricture.

A Proper Way to Stop the Discharge.—The logical method of stopping the discharge, **which is a symptom only**, is to remove the cause upon which the "leak" depends, i. e., to correct the congested and inflamed condition of the mucous membrane. This can be done in a most satisfactory manner by a prescription of Lloyd's Hydrastis, which, at the proper period, will be found to **act kindly and effectively**. Under its influence the congestion is overcome, the discharge lessens, and finally ceases altogether. The patient is **cured** and he suffers no deleterious after effects such as are almost sure to follow when **dangerous astringents are used to abruptly check the discharge**.

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For the purpose, then, of stopping the discharge by **relieving the condition upon which such discharge depends**, the following prescription may be used, with every assurance of success:

℞. Lloyd's Hydrastis, - - - 4 ounces,
Aqua Destillata, - - - - 6 ounces.
Misce. Sig. Use half an ounce of the mixture
at a time as an injection three times a day.
Shake before using.

This prescription is colorless, and is non-irritating. When first used, and the parts are tender, the sensation may be unpleasant if the solution be cold; hence the patient should be directed to warm the liquid to a tepid heat (blood temperature), before injecting. But after a few days the parts will become so much better that it can be injected at ordinary temperature without causing any unpleasant feeling.

If this prescription does not effect a complete cure, it will benefit the case so that the discharge will almost cease, and probably within a reasonable period, only a few drops of mucus will escape during the entire day. Should it not in a moderate period remove every outward vestige of the disorder, the prescription may be made stronger:

℞. Lloyd's Hydrastis, - - - 4 ounces,
Aqua Destillata, - - - - 4 ounces.
Misce. Sig. Use a half ounce of the mixture
as an injection three times a day. Shake before
using.

This will generally complete the cure, but it is well to repeat the injections occasionally for a couple of weeks after the cure seems complete. A final microscopic examination should also demonstrate that the gonococci are no longer present.

Regarding Syringes.—The ordinary long-point syringe is usually recommended, but as the insertion of the long nozzle into the inflamed urethra is accompanied by more or less pain, owing to the extreme sensitiveness of the parts, the cone-point is recommended, as being less liable to cause irritation.

In using the syringe, the cone point is to be inserted into the meatus, and the nozzle pressed firmly against the opening while the injecting fluid is gently and slowly forced into the urethra, distending the canal, and coming in contact with the entire mucous surface.

If care is used in manipulating the instrument, and the injecting fluid is non-irritating, (as in the case of the prescriptions commended herein), the injection should not be attended by pain.

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Aids to the Cure.—The patient should be made to understand thoroughly that his habits and mode of life have much to do with the severity of the symptoms, and the length of time necessary to recovery. The physician should insist upon the avoidance of sexual intercourse, alcoholic liquors, undue exertion, late hours, and dissipation of every form and description. Many cases of gonorrhea, as has been stated, are apparently cured in a very short time, but some indiscretion on the part of the patient, before the infection is altogether removed, may bring on all the symptoms again. Physicians should therefore insist on absolute obedience to these rules, to the end that a speedy and complete cure may be accomplished; for, unless the patient does this, the disease is almost sure to terminate in an intractable gleet.

Exceptional Cases.—That some cases of gonorrhea are exceedingly tenacious is usually the fault of the patient, and is due either to some indiscretion on his part, or to a debilitated condition of the system which must be corrected, after which the disease may be readily overcome.

The treatment and prescriptions given will usually complete the cure, even in persistent cases, if sufficient time be given to overcome the inflammation, and in all cases it will modify the disease so that the more astringent prescriptions to follow may then be used without risk of causing stricture.

Persistent Cases.—Let me repeat that sometimes the discharge ceases altogether and the patient thinks he is cured, but that it may reappear after violent exercise or other indiscretion. Under such conditions a virulent local area remains diseased, although most of the urethral tract has been restored to its normal state. In such exceptional cases the small amount of mucus present has been unnoticed, for it is washed away by the passage of the urine. To test this condition the patient, on arising in the morning, should gently squeeze the penis. If the disease has not been entirely eradicated, a small drop of mucus will appear at the meatus.

To cure these tenacious cases, where the foregoing prescriptions do not effect a complete recovery, one of the following astringent prescriptions may now be employed:

No. 1	B	Acid Tannic	- - - - -	½ drachm.
		Lloyd's Hydrastis	- - - - -	1 ounce.
		Aqua Destillata	- - - - -	3 ounces.
		Dissolve the tannic acid in the water, then add the Lloyd's Hydrastis.		

Sig. Use from ½ ounce to an ounce of the mixture at a time as an injection. Shake before using.

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No. 2 R Zinc Sulphate - - - - - 5 grains.
 Lloyd's Hydrastis - - - - - 1 ounce.
 Aqua Destillata - - - - - 3 ounces.
 Dissolve the zinc sulphate in the water, then add
 the Lloyd's Hydrastis.

Sig. Use from $\frac{1}{2}$ ounce to an ounce of the mixture at
 a time as an injection. Shake before using.

No. 3 R Plumbi Acetas - - - - - 5 grains.
 Lloyd's Hydrastis - - - - - 1 ounce.
 Aqua Destillata - - - - - 2 ounces.
 Dissolve the plumbi acetates in the water, then add
 the Lloyd's Hydrastis.

Sig. Use from $\frac{1}{2}$ ounce to an ounce of the mixture at
 a time as an injection. Shake before using.

While these astringents, if employed in the first stages of gonorrhea, are liable to cause stricture, and should never be used in the acute stage, their final use is attended with most excellent results, after the preliminary antiseptic cleansing and the employment of the simple prescriptions of Lloyd's Hydrastis for a couple of weeks has almost entirely restored the normal condition of the infected parts. It is desirable, however, if possible, to patiently continue the milder treatment and avoid altogether the use of astringents.

Let it be remembered, furthermore, that it is better to be sure of a perfect cure, than to neglect final precautions. It is better to repeat the injection of the curative prescription occasionally during a few weeks after the discharge disappears, than to permit an infected patch to lie dormant or increase, and to breed a recurrence of the disease. Be sure no taint of infection remains.

The Copaiva Treatment.—The old method of treating gonorrhea by means of yellow hydrastis preparations, or nasty cubebs, balsam copaiva, oil of copaiva, or oil of cubebs, is happily obsolete. Modern physicians have learned that the disease in men yields readily to pleasant medication, and that the use of such offensive and nasty remedies as were once considered necessary is a relic of barbarism. The treatment directed herein is both pleasant to the patient and prompt in result. The use of nasty remedies that torture the patient, and by their odor offend his friends, is neither necessary nor desirable. Especially should physicians and pharmacists warn the afflicted against the many yellow nostrums advertised so extensively in newspapers and elsewhere, these being merely solutions of astringents, colored yellow with berberine, which in itself is harmful in mucous membrane diseases.

Treatment for Gonnorrhea in Women.

The primary object in treatment of this disease is to destroy, as early as possible, the specific nature of the disease and prevent extension of the inflammation. If treatment is seen early, while

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the affection is confined to the vulva and lower vagina, the parts should be thoroughly cleansed as a preliminary step by the use of antiseptics, as follows. A vaginal douche of corrosive sublimate solution (1-2000) should be used two or three times a day for three days, following this by the injection of a quart of normal salt solution carrying two ounces of Lloyd's Hydrastis. This is followed by the application to the vault of the vagina of a tampon holding a 25 per cent aqueous solution of argyrol. The parts are to be kept scrupulously clean, and the vulva bathed frequently with a 1 per cent solution of lysol. If argyrol* or lysol are not at hand, boric acid may take the place of the former by depositing two or three drachms of the acid in the vault of the vagina, inserting a tampon, and withdrawing the speculum. As a substitute for lysol, we may use 20 grs. of Asepsin to the pint of water; or lacking the Asepsin, a solution of borax or boric acid may be used. Perfect cleanliness is the object sought. After a few days of this treatment to cleanse the parts and destroy the infecting bacteria, the remaining inflammation can be overcome by the application of Lloyd's Hydrastis, either by means of the tampon or by an injection. The strength of the solution may be made to suit the grade of inflammation present. If used as an injection, use

R Lloyd's Hydrastis - - - 4 ounces.
Aqua Destillata - - - 8 ounces.
Misce.

Sig. Inject one to two ounces of the mixture
three times daily.

If applied by tampon, use equal parts of Lloyd's Hydrastis and water, mixed.

If more stimulative treatment is required, the Hydrastis may be mixed with its bulk of a mixture of equal amounts of distilled hamamelis and water. The addition of 1 to 2 grains of zinc sulphate to the ounce of the mixture will often prove of advantage when we desire to increase the astringent effect of the remedy.

If the disease involves the urethra, additional treatment must be directed to the urethral canal, which should be thoroughly cleansed by means of a reflux catheter by irrigating with normal salt solution, carrying two ounces Lloyd's Hydrastis to the pint. It may be necessary to overcome the extreme sensitiveness of the urethra by applying a four per cent solution of cocaine hydrochlorate before attempting to irrigate. After the canal has been cleansed, a 20 per cent solution of argyrol is to be applied the full length of the urethra.

*Norm.—Argyrol. Silver Vitellin.—*Merck's Index*.

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This is accomplished by introducing a urethral speculum and carrying it to the internal meatus. A pledget of cotton, wound around the point of an applicator, is saturated with the solution of argyrol and passed to the upper end of the canal, the speculum removed and the applicator slowly withdrawn. This is to be repeated each day until all evidence of infection has disappeared. In case argyrol can not be procured, nitrate of silver solution (gr. ii to the ounce of water) can be used instead. The urethral canal is to be washed out daily with an injection of a few ounces of the following prescription:

R. Lloyd's Hydrastis	-	-	-	4 ounces.
Aqua Destillata	-	-	-	8 ounces.
Misce.				

More Serious Complications.—Should the gonorrheal inflammation unfortunately have extended to the cervix uteri and uterine endometrium, a thorough curettement is to be done immediately, to prevent, if possible, an extension of the inflammation to the Fallopian tubes, gumming them up and causing a permanent sterility. Curettement should be thorough, and the uterine cavity irrigated at the same time with corrosive sublimate solution, (1 - 2000). This is to be followed by normal salt solution, (a teaspoonful of salt to the pint of water), and by the careful application of pure carbolic acid to the infected walls of the cavity, care being taken not to touch healthy surfaces. The curettement removes all diseased and infected tissue, which is washed away by the antiseptic douche, whilst at the same time every vestige of infection is destroyed by the carbolic acid.

Likewise, if when treating an acute gonorrheal urethritis, vaginitis or vulvitis, there should be a sudden extension of the disease to the uterus, curettement should be done at once, as in such cases mere temporizing or conservatism is not to be thought of. An early curettement will avert the danger to health and life, which results from the extension of the disease to the oviducts.

The bowels should be kept open by the use of epsom salt, and general hygienic measures should be observed. If the disease passes beyond the power of medication, the surgeon must be appealed to as a lamentable, but final resort.

Caution.—In conclusion, let it be indelibly impressed upon the minds of all concerned, that gonorrhea is **actively dangerous** to the life and health of women who may become infected, on account of the tendency of the disease to extend to the oviducts and peritoneum, thereby entailing much suffering, sterility, chronic tubal lesions and peritonitis, **necessitating** in the end **removal of the uterine appendages**, and that the prognosis will depend upon the extent of infection, and the promptness and thoroughness of the local treatment. The physician should insist, therefore, on a rigid observance of all instructions, and that the treatment be extended a sufficient length of time to eradicate every vestige of the disease.

Gonorrheal endometritis is the most frequent cause of sterility in newly married women. In many such cases the disease is **contracted from the husband**, who believed himself cured before marriage,

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but in whom gonorrhea was latent. In many cases of this nature, the unsuspecting wife is attacked so insidiously that the only symptom of the disease, beside the resulting sterility, is a leucorrheal discharge, which, at the time, occasions no concern. In the end, however, the tubes are invaded, the ovaries affected, and the patient develops a chronic invalidism, terminating in terrible suffering.

For the sake of womankind, every case of gonorrhea in the male, no matter how slight it may appear to be, should be carefully watched and treated until we are positively assured that **not a remnant of the disease remains**, not only because of the remote danger of stricture, but also that certain contamination of the female (perhaps a wife), with whom the man may cohabit, shall not take place, with disastrous results to both herself and her offspring. It is also the imperative duty of the physician to firmly oppose the marriage of any man who has gonorrhea, until such time as the physician shall be positive no vestige of the disease remains. Let it therefore be repeated, **be insistent, be firm**, in this matter.

The Uses of Specific Medicine Hydrastis.—By Chauncey D. Palmer, M. D., Professor of Obstetrics and Diseases of Women, in the Medical College of Ohio. Hydrastis proves to be an excellent stomachic tonic. It is doubtless indicated in catarrhal conditions of the stomach, duodenum and biliary passages. But the best effects from Hydrastis, in my experience, have been obtained, by the administration of the same, three times a day, for a long period of time, when there is memorrhagia, as the result of some forms of fibroid disease of the uterus. A combination of Helonias, Caulophyllum and Cimicifuga, given three times a day, proves to be, in my experience, a most excellent tonic, for certain diseased conditions of the uterus.

It gives me more than the usual amount of satisfaction and pleasure to speak of the efficacy, and the reliability, of the Specific Medicines, remedies which, I believe, possess all of the intrinsic values of the drugs, without any of the superfluous, or extraneous ingredients.

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The sphere of general usefulness and therapeutic field of the preparation, now known to almost every physician and pharmacist of America as Lloyd's Hydrastis, can be best shown by reproducing verbatim this original label, which is still retained upon the bottle.

Uses of Lloyd's Hydrastis.

THE ORIGINAL LABEL.

PHYSIOLOGICAL ACTION.—(By Prof. Roberts Bartholow.) It is promptly absorbed, for the action begins in a few minutes after it is thrown under the skin of an animal. It affects the system and causes tetanic convulsions in one-half the time necessary for the official fluid extract to produce an impression, and it has about twice the strength of the latter.

GENITO-URINARY DISEASES.—(By Prof. Wm. Judkins.) *For Ulcerated Cervix.* Saturate a tampon of absorbent cotton with the solution full strength, and apply every third day through a speculum, allowing it to remain *in situ* 24 hours. During the interval, use an injection of one ounce of Lloyd's Hydrastis in a pint of warm water, morning and evening.

In Leucorrhea.—Inject a solution of one or two ounces of Lloyd's Hydrastis in a pint of water, two or three times daily.

For Chancroids and Chancres.—Apply with a cotton mop, full strength. Immediate benefits will result.

In Gonorrhea.—Dissolve one grain each of acetate of zinc and acetate of lead in a mixture of seven drachms of water and one drachm of Lloyd's Hydrastis. Use as an injection. Acute and chronic cases yield in a short time, compared with former modes of treatment.

THROAT DISEASES.—(Uses in Throat, Ear, and Eye, by Prof. Robert Sattler.) *In simple Catarrhal and Granular Pharyngitis, Rhinitis, also in the more acute ulcerative or aptous varieties of catarrhal inflammation of the pharynx, tonsils, and retro-pharynx.* Mix one ounce of Lloyd's Hydrastis with four or six ounces of water, and use as a spray; or mix one ounce with two ounces of mucilage of acacia and five ounces of water, and use as a gargle and wash; in warm weather add a few drops of carbolic acid to preserve the mixture.

In Subacute and Chronic Naso-Pharyngeal Catarrh, the above spray application has a most beneficial effect, where the mucous membrane is dry and parched, and the secretions are altered in quality and quantity. In the hypertrophic form of this troublesome affection, with profuse discharge, and thickening of the mucous lining of the nose and retro-pharynx it may be used in stronger solution, equal parts of Lloyd's Hydrastis and water, or even stronger.

In many cases astringent or antiseptic remedies may be combined with the spray or gargle, among the best (antiseptic) being the addition of from four to six grains of sulphocarbonate of soda or zinc to each fluid ounce of the spray liquid; and the best astringent combination being—Lloyd's Hydrastis, one fluid ounce; Aqueous fluid extract of Pinus Canadensis, half fluid ounce; distilled water, six and a half fluid ounces. Mix.

EYE DISEASES.—*Catarrhal and Purulent Conjunctivitis, in their various forms.* A useful, cleansing, and soothing remedy is—Lloyd's Hydrastis, half a fluid ounce; water, eleven fluid ounces; use as a wash and to bath the eye.

EAR DISEASES.—*Chronic Otitis Media Purulenta, in some forms, with profuse Mucopurulent Discharge.*

Half an ounce of Lloyd's Hydrastis to six or eight ounces of water; or

One ounce of Lloyd's Hydrastis, four ounces of creosote water, and five ounces of water.

Use either of the above as a wash by syringe, or drop ten or fifteen drops into the ear after syringing, twice a day. In some cases combination with salts of zinc is desirable.

INTERNALLY.—*In Atonic Dyspepsia, Anorexia and in Fermentative Dyspepsia.* Under proper dietetic restrictions, give before each meal a teaspoonful of the following mixture: Tint. Nux Vomica, gr. xx; Podophyllum, ʒss; Lloyd's Hydrastis, ʒij; Distilled Water, ʒij.

Some forms of Dyspepsia are immediately relieved by tablespoonful doses, before meals, of a mixture of Lloyd's Hydrastis, ʒij; Old-fashioned Elixir of Calisaya, ʒvi.

In Chronic Gastritis and Gastric Catarrh.—Give 10-drop doses of Lloyd's Hydrastis three times a day, in a little water.

In the Vomiting of Pregnancy.—Give 20 to 40 drops of Lloyd's Hydrastis in a little Catawba wine an hour before rising.

In Malarial Troubles.—Associate Lloyd's Hydrastis with quinine or cinchonidia. You can cure intermittents with a third less quinine, and avoid cinchonism.

The following will be found reliable: Quinine, ʒss; Lloyd's Hydrastis, ʒss; Elix. Simplex, q. s. to make ʒiv. A teaspoonful every two or three hours.

In Convalescing it is a good tonic, in doses of from 5 to 20 drops in water or milk three times a day. It acts kindly on the intestinal mucous membrane, and is strongly indicated in imperfect recoveries from diarrhea, dysentery, etc.

TAKE NOTICE. LLOYD'S HYDRASTIS, when diluted, may develop an organic growth in a few weeks' time; hence, only enough should be diluted to last for a week or two. The toxic action mentioned by Professor Bartholow was overcome by reducing the proportion of the irritating constituents.

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SPECIAL.

The accompanying Treatise is a part of a series that, when completed, will give physicians preserving same a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles will appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them.

The next of this series of Drug Treatises will be of unusual interest, and of especial value, in that it will present a study, from the very beginning, descriptive of the resinoids, alkaloids, and the so-called concentrations, of American pharmacy. These preparations half a century ago commanded unusual attention throughout American medicine and pharmacy, and became known as the "Eclectic Concentrations." Their story reads like a romance, and their complicated history and record, even though apparently given in detail, must be very much abridged. We bespeak for the recipients of this series of Drug Treatises, in Number XXIV, a treat, both educational and pleasurable. The actors in this great tragedy, for the record of these preparations is that of a tragedy, have passed away, and the bitterness that was apparent in the day of the crusade of the resinoids, no longer disturbs the professions of medicine and pharmacy. The telling of this story in its authoritative details is possible, perhaps, only to the authors of this series of Drug Treatises, and for this reason its presentation, as a matter of historical preservation, should no longer be delayed.

PRICES OF HYDRASTIS PREPARATIONS.

Lloyd's Hydrastis	¼-lb.	\$0.65	By mail, 87c each.
	½-lb.	1.20	Not mailable.
	1-lb.	2.25	Not mailable.
Specific Medicine Hydrastis.....	¼-lb.	1.85	By mail, \$2.07 each.
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Solid Extract Hydrastis.....	per ounce,	2.00	By mail, \$2.08 each.
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" Nitrate	"	6.00	" 6.08 "
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" Principles Combined.....	"	2.50	" 2.58 "

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A TREATISE

ON

The American Alkaloids, Resins, Resinoids, Oleo-Resins and Concentrated Principles (so-called Eclectic Concentrations).

We consider this Treatise, (No. XXIV), one of the most important, historically and otherwise, of all the Drug Treatises issued to date. Its preparation necessitated much research in a direction that only the volumes in the Lloyd Library made possible. Even then, but for the author's familiarity with the times, events, and personages involved, as well as with past current literature, the work might not have been as satisfactorily accomplished.

In preparing this Treatise, it was soon discovered that the condensation necessary to the space at our command precluded the introduction of much literature from the past, that should be issued verbatim, as well as many biographical sketches, and a table of bibliographical references to the more important works bearing on the subject. It was therefore determined that a complete presentation of the subject should constitute Bulletin No. 12, Lloyd Library Series. In that, however, Part Second of this Treatise, (pages 23 to 31), is largely excised. The Lloyd Library Bulletins mentioned, (see pages 6, 9, 10, 13, 14, 21, 23, 26, 29, etc.), are published for educational and scientific purposes, and to exchange for scientific publications, and are seldom of interest in outside circles. They can be obtained, as long as in print, by enclosing \$1.00 (each), to The Lloyd Library, Cincinnati, Ohio.

This entire Treatise No. XXIV has been written by John Uri Lloyd.

For list and description of Drug Treatises issued to date, see second cover page.

Drug Treatise No. XXIV.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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Treatises on Drugs and Medicines.

We issue systematically special treatises (historical and therapeutical, 16 to 48 pages each) on drugs, both new and old, and their therapeutical preparations. These treatises are encyclopedic, and highly valued for their intrinsic worth. They are in great demand by scientific men and physicians, for they give the authentic history, description, constituents, uses, and doses of each drug. The medical uses and qualities and scientific descriptions are written for each treatise by selected authorities. We mail these treatises free, on application, to physicians only. In this connection we call attention to the fact that our preparations are restricted to physicians' use, that we make no remedies for popular use, and that we neither advertise nor supply medicines for the home cure of disease.

- Treatise No. I embraces Thuja Occidentalis.**
 - Treatise No. II embraces Cactus Grandiflorus.**
 - Treatise No. III embraces Pilocarpus (Jaborandi).**
 - Treatise No. IV embraces Veratrum Viride.**
 - Treatise No. V embraces Chionanthus Virginica.**
 - Treatise No. VI embraces Asepsin and Asepsin Soap.**
 - Treatise No. VII embraces Collinsonia Canadensis.**
 - Treatise No. VIII embraces Nux Vomica.**
 - Treatise No. IX embraces Gelsemium.**
 - Treatise No. X embraces Belladonna.**
 - Treatise No. XI embraces Oenanthe Crocata, Vegetable Caustic and Crataegus.**
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 - Treatise No. XVII embraces Mangifera Indica and The National Pure Food and Drug Act.**
 - Treatise No. XVIII embraces Libradol.**
 - Treatise No. XIX embraces Sulphurous Acid, Hydrochloric Acid, Carbolic Acid, Sodium Sulphite, Sodium Phosphate and Ferri Acetas.**
 - Treatise No. XX embraces Cupri Acetas, Carbo Vegetabilis and Triturated Podophyllin.**
 - Treatise No. XXI embraces Apis, Tela Araneæ Cantharides and Spongia [in press].**
 - Treatise No. XXII embraces Opium, and its Eclectic Substitutes.**
 - Treatise No. XXIII embraces Hydrastis Canadensis.**
 - Treatise No. XXIV embraces The American Alkaloids, Resins, Resnoids, Oleo-Resins and Concentrated Principles (so-called Eclectic Concentrations).**
 - Treatise No. XXV embraces Glyconda and the History of Neutralizing Cordial.**
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LLOYD BROTHERS, Cincinnati, Ohio.

The American Alkaloids, Resins, Resinoids, Oleo-Resins and Concentrated Principles.

PART FIRST.

HISTORY (1839-1909.)

Condition in Therapy Preceding the Concentrations.—

The story of the "Eclectic Concentrations" can not be intelligently presented without picturing, briefly, social conditions as well as various problems concerning medicine and pharmacy at and preceding the date of their introduction. Nor can this story be fairly told, even at this late day, without many regrets, even though its various phases be handled in the most sympathetic manner. Appalling is the record left in print concerning the cruelties and the crudities at that date practiced in the name of medicine. Pathetic is the recollection of the effects of the old-time standard medicines. The story is one and the same, whether the treatment be that of a strong man attacked by an acute trouble, undergoing a course of mercurial cathartics, bleeding, and cantharides blistering; of a tortured girl in the last stages of consumption, with breast a running sore from the tartar emetic plaster, or croton oil vesicant, applied by the physician; or the fever-parched, helpless child, confined in a hot, closed room, denied a breath of fresh air, vainly pleading for a spoonful of cold water or a bit of nourishing food. Alike the course of authoritative medicine and of private dosing, whether in Europe or America, consisted in cruelty piled on top of torture, of catharsis to physical depletion, of cupping blood through the skin, and the copious abstraction of much-needed life blood from the veins of a patient who had been starved to exhaustion, by direction of the man who blistered and bled and purged. Then, the step of the physician made the sick man shudder. At the word *medicine* the child would cry in fear.

According to the medical theories largely prevalent in the Mediæval past, diseases were to be considered not as departures from the normal, but as the effects of aggressive devils or evil spirits, to be driven out by fire and sword. The era had but recently passed when religious conceptions of natural influences by the powers above and below were contrived to modify ailments and afflictions. Tra-

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ditions that had traveled down the centuries bound men unaware of such subjection to conceptions concerning disease difficult now to comprehend. Astrology and the influence of the planets, and the belief in the mysterious power of the number 13, is even to-day a study of men possessed of balanced education, whilst as late as the day of Culpepper the description of each plant was prefaced with the name of the planet that was supposed to dominate its action. Far back of it all, and yet influencing it all, is seen the age of imaginative conception, of poetic imagery, that constructed man-bred gods and goddesses, such as directed the affairs of men in the day of the glory of Olympus. Natural, was it not, that out of this epoch of necromancy, superstition, and fantastic poesy, diseases should have been viewed as essences from without, sent by an omnipotent Creator or an antagonistic devil to torture the flesh of man? Nor could it be expected that an empirical art, linked with such as this, should have lost its traditions by being transplanted to America.

In the opinion of even authoritative practitioners of medicine of Colonial days, the devilish or spiteful intruders could no more be subjugated by kindness than could the Prince of Evil be subdued by friendship. But yet the man of medicine might not openly view them as devils or spirits of evil, and might resent such a reflection. But, whether the *ideas* of old prevailed or not, the *methods* of old yet lingered. Although the disgusting animal remedies once favored were neglected, the most poisonous of drugs were administered in heroic dose, or the method that was the most barbarous or disagreeable, was considered, even by conservative therapeutic authorities, including the most sympathetic physicians, at the date of the introduction of the "American Eclectic Concentrations" as the remedies most likely to serve the sufferer and to save life.

In view of these conditions, need any apology be made for the fact that the remedial agents of the first part of the last century were necessarily either nauseating and disgusting, or vicious, cruel, and in dosage too often deadly? Whosoever will study the records of the past will perceive that, whilst poisonous drugs, nauseating doses, and excruciating applications were authoritative favorites, the substances that produced the most pronounced shock were viewed with the greatest favor, even though they were directly followed by marked or even serious after-consequences, in some instances more terrible than the primary disease for which they were administered. Let any pharmacist or physician, of any school whatever, read the story of those days, as voiced in the authoritative medicaments and by the *treatment* of licensed physicians, as well as that given in many works

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then standard, on Practice and Materia Medica, and consider how he would feel *now*, were he to attempt to practice his art under the limitations then rigorously enforced, or what would be his course were a loved one undergoing the ordeal. To place oneself in that critical attitude is to stand where stood the *protestors* against medical authority, in the beginning of the last century.

The Uprising.—In that day in America the dogmatism of intolerance dominated those in power, whether in politics, religion, or medicine, and possibly nowhere was the battle more fiercely fought than in the last-named field. The physician who discredited the prevailing methods, and who was courageous enough to voice his protest, was likely to be ostracized by many of his brethren, as a person tinctured with quackery and linked with charlatanism. Intelligent and educated laymen, protesting against the barbarisms to which their loved ones were being subjected in the name of authoritative medicine, were, as a rule, neither given a respectful hearing, nor recognized as being entitled to any consideration whatever. The first great American "Trust" was that formulated in behalf of medicine, medication, and dogmatism such as this, though it be said its votaries *believed* their crusade to be in the direction of the suppression of quackery advocated by men incompetent to know what was needed in medicine. Out of it all came naturally a popular uprising against the methods of "Fashionable Doctors." It was born of a wave of righteous indignation—not against individuals—but against cruelties almost universally practiced, and against fallacies that were apparent to all but those involved in their practice.

In that period also arose, of like necessity, the kindly European Homeopathic school, as an emphatic protest against all that was cruel and destructive. Even doubters of Hahnemann's theory believed that a peaceful, natural death was to be preferred to one of needless torture, and that it were better to take no medicine at all, and in a spirit of hopefulness allow nature a chance, than to follow the way of those who passed into the hands of such practitioners as the famous English Dr. Lettsom (John Coakley),* concerning whose methods a critic ventured to write:

* Dr. John Coakley Lettsom was born in the Virgin Islands, West Indies, in 1744, and died in 1815. When six years old he went to England, and came to the notice of the celebrated preacher Samuel Fothergill, by whom he was sent to college. He was next apprenticed to Abraham Sutcliffe. Thence going to London, he became a pupil of the celebrated Dr. John Fothergill, a brother of the aforementioned minister. In St. Thomas' Hospital he attended the lectures of the renowned Dr. Fordyce, Benjamin Cowell the surgeon, and others. Marvelous was his progress after graduation, for within six months he cleared ten thousand dollars. Then he went to the University of Edinburgh and studied under the celebrated Doctors Cullen

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I puke, I purge, I sweats 'em,
And if they die,—I* Lettsom.

Into such times as these, and among such methods as then prevailed, came Wooster Beach, Samuel Thomson, John King, and other American reformers from both within and without the only authoritative school of medicine then existing, for no recognition had as yet been given the followers of Hahnemann. Moved alike by the same cry of tortured loved ones that swept over America as it did over Europe, this conglomeration of dissenters united against a common enemy. During the first part of the nineteenth century these and such as they, educated and uneducated—many qualified by law to practice medicine, but the majority ignorant of the very principles of therapy—conducted their crusade against death-dealing medicines and the wrongs of a system of medication whose votaries so often considered the advocating of kindness to the sick as rebellion against lawful authority, and the application of humane methods to the suffering, as a crime against established science.† Throughout all America came this uprising of the people, no section being exempt. From Massachusetts to Florida, from the Atlantic to the Mississippi, the rebellion raged. It was a combination of the unorganized, unprofessional majority, assisted by an inside, rebellious, self-sacrificing, professional minority. It was a home-to-home crusade, that needed no outside

and Home. Thence he traveled, and practiced medicine, joined medical societies, and was made honorary member of associations and societies without number; this because of his literary activity, his scientific qualifications, his remarkable success in practice, and his general reputation. He wrote many biographies, was a contributor to the "Gentleman's Magazine," and left large volumes of manuscript lectures on medicine. Lettsom was one of the founders of the Medical Society of London, where his name is commemorated in the "Lettsomian Lectures." In 1812 he became president of the Philosophical Society of London. He warmly supported Jenner's claims for vaccination. He wrote on industrial and agricultural subjects, among others making a study of the Mangel-wurzel and the history of the tea tree, for which latter he was complimented by Linnaeus on account of his botanical description. These and other works and prints too numerous to mention stand to the credit of John Coakley Lettsom, who without any special opportunity passed from an obscure home in one of the West Indian Islands to such conspicuity that his name was familiar to every reader of his day.—L.

* At that date the letter *I* was often substituted for *J*.

† It must not be forgotten that this crusade in behalf of the people was favored by a large number of physicians and many authorities of the dominant school, for among the most aggressive of the protestors were numbered many physicians who rebelled against the barbarisms then prevalent in medicine. Nor were all medical authorities content to accept the dogmatism of that date. Read the Collections of B. S. Barton, M. D. (Lloyd Library Bulletin No. 1) or Zollickoffer's *Materia Medica*, or Tully's great two-volume treatise, or even Thacher's *Dispensatory*, to perceive that the dissenters had earnest co-laborers within the medical trust. See also Lloyd Library Bulletin No. 11. Read the letters of the talented Professor Waterhouse, M. D., of Harvard University. Remember that Wooster Beach was a graduate of the Medical Department of the University of New York, and John King was an educated man of many languages, a lecturer on such scientific subjects as Geology, Magnetism, Astronomy, and Physiology in the Mechanics' Institute of New York before he took part in the American crusade for better medicines and kinder medication. But such facts as these did not prevent such men as these from being ostracized (by authority) as quacks and charlatans.

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witnesses, no argument from afar, because in every American household pleaded the face of a tortured loved one or lingered the memory of one who had failed to withstand the physician's inhuman ordeal.

Thus it was that, powerless to effect reformation within the ranks, men of learning, as well as the common people, formed their "societies" in the great outside, their object being alike to serve humanity and, as they also hoped, the cause of medicine. This latter object could be attained only by discovering better, and milder, remedies than those transplanted from abroad, to be employed by somewhat similar but yet more kindly methods.

With this in view, a great section, seeking a *new materia medica*, turned naturally to the development of American remedies of botanic origin.* The preparations employed were simple and compound syrups, tinctures, acetates, juices of plants both fresh and dried, as well as powders, infusions, and decoctions of substances generally fitted for domestic preparation. As a rule the dose was large, often distressingly nauseating, and in some cases barbarous, as judged by the standards of the majority of physicians to-day, for even these "Reformers" could not, at the start, disenthral themselves from the transplanted, Mediæval, European medication fallacies and the methods that encompassed and entangled them. Cullen's *Materia Medica and Practice*, the Edinburgh and London Dispensatories, the works of Quincy and of the domestic European empiricists of that date were in many American households, and these, together with traditional precepts, could not but make an impression. Even those in rebellion against dominant methods too often imagined that a medicine, *to be useful*, must be disagreeable, and that the depleting action of both the cathartic and the emetic was a necessity, in the simplest ailment. The phantom of "disease devils" still lingered, and tintured the methods even of the revolutionists. Thus it came that too many of the reform remedial substitutes, introduced to replace more barbarous remedial agents, were themselves viciously energetic, whilst the primitive surgery of those days is frightful to contemplate. Witness the treatment by his father (from which he barely escaped with his life) of that arch-rebel of them all, Samuel Thomson, in the case of a severely cut ankle.

I had the misfortune to cut my ankle very badly, which accident prevented me from doing any labor for a long time, and almost deprived me of life. The wound was a very bad one, as it split the joint and laid the bones entirely bare,

* Talented men in authoritative positions also cherished hopes concerning the possibilities of the American Flora. The two Bartons, Thacher, Zollicoffer, even Dunglison, may be cited. However, with the advent of the "Irregulars," the "Botanics," the "Indian Doctors," and such, the "Regular" profession, strangely enough, relinquished their study of the American Flora and, yet more strangely, ostracized the intelligent outsider who was specializing in this line. In this was lost a mighty opportunity.

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so as to lose the juices of my ankle joint to such a degree as to reduce my strength very much. . . . My father, in dressing my wound, had drawn a string through between the heel-cord and bone, and another between that and the skin; so that two-thirds of the way round my ankle was hollow.—*Lloyd Library Bulletin, No. 11, pages 6 and 7.*

No intelligent patient of to-day would tolerate either Samuel Thomson's heroic courses of lobelia medication or Beach's too frequently nauseating, botanic drug mixtures, nor would such systems be unflinchingly practiced to-day by an Eclectic or Thomsonian physician of repute, any more than would the Allopathic medicine and methods, then "Regular," be followed now by the most orthodox in the ranks. But severe as were the methods of the reformers, they were soothing and kindly, as contrasted with the blistering, bleeding, purging, and vomiting of those practicing the imported, Mediæval system of European medication. Largely for this reason "domestic" and "Irregular" medication became the hope of a great section of the American people.

The view presented, when from this distance the epoch is taken as a whole, is surely sufficient to enable one to comprehend much that the actors, involved in the passing along, could not perceive. A far-reaching social revolution was in progress. One party believed in *tradition* and in *authority*, and held that progress must come from *within*, and not from *without*. The other party, perceiving only the wrong of methods established, as they believed, in error and superstition, became hopeless of their correction by the men practicing those cruelties. It was a far-reaching uprising, in which a people more enlightened than formerly, more independent of authority than ever a people had been before, united in a rebellion, not against individuals, but *conditions*. It was a campaign of education, in which the side in power was organized, trained, and all-powerful; the other was heterogeneous, composed of the ignorant as well as people of education, who presumed, for love of humanity, to demand of authority that cruelty in behalf of tradition be abolished. In this mighty uprising the alkaloids, resinoids, and such came into play, but were an incident only. They failed primarily, but yet served a mighty secondary purpose, for they hastened the day when Eclectic physicians and a great part of the dominant school should abandon heroic dosage as well as depleting medication.*

Discovery of the First of the Eclectic Resinoids.—The alkaloids quinine and morphine, and the energetic resin of jalap, had but recently been established in authoritative practice as the pioneers of a new class of ultimates in plant products. These, evolved abroad from

* Should the author presume, ever, to picture those times as he believes they should be pictured, a fund of curious extracts from past literature will prove available.

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drugs of foreign origin, were naturally welcomed by the dominant school, closely affiliating as it did with all that came from Europe, and being energetic in small doses, they served well the heroics in practice. But it remained for Dr. John King, an educated medical reformer, to take the first step in the direction of a similar class of American ultimates. In 1835 (see history and references in Drug Treatise No. XX, and Lloyd Library Bulletin No. 12) he accidentally discovered Resin of Podophyllum, which may be designated as the resinoid forerunner, because it constituted the first American member of that list of preparations. At first Dr. King's experiments promised brilliant results. The energetic resin of macrotys* was quickly followed by the resins and oleo-resins of iris, black cohosh, leptandra, and others. To his mind came then, naturally, the question as to why the major part of the American materia medica in use by the "Reformers" might not yield ultimates, many of them equally valuable, which in minute amounts would parallel the large doses of their respective crude drugs. Great was his enthusiasm in this work, greater was it in behalf of improved methods for curing disease by means of small doses of palatable medicines. Little, however, did he imagine, in the enthusiasm of his discoveries, that his own hand, in a day to come, was destined to deal the most crushing blow to these same products, when, by their indiscreet use and by reason of the commercial methods that were applied in their direction, they had all but wrecked the cause of Eclecticism, to which he had devoted his life work.

The original method of making the Resin of Podophyllum, as given by Dr. King in the *Medical Reformer*, was as follows:

I obtain only the resin, by extracting all that alcohol will take up, then filter the alcoholic tincture, to which I add an equal amount of water, and separate the alcohol by distillation—the resin sinks in the water.—*Western Medical Reformer*, 1846, p. 176.

This process, without materially† altering the product, was afterwards improved by evaporating the alcoholic tincture to a cream, pouring it into cold water, and collecting the precipitated resin. This resin stands to-day, as then, typical of the cathartic side of podophyllum, but it is yet not a representative of all that lies in podophyllum.‡ Nor is

* Discovered by King shortly after the Resin of Podophyllum.

† This word is used necessarily. The resin made by King's original process is cleaner, and more energetic, than the resin made by the official process. This results mainly from the dilution of the extract (tincture) at the time of precipitation by the water. This permits the resin to fall in a state of very fine division, each particle being well washed of extractive matter by the water.

‡ Scudder's *Alternative*, yet a favorite remedy with many physicians, was designed to exclude the cathartic resin and to utilize the tonic constituents of this drug. See Am. Disp., 1866, and subsequent editions. Within the last year Dr. N. M. Dewees, of Cambridge, Ohio, has also introduced an Elixir of Podophyllum, long in use in his practice, that is very pleasant, very effective, and yet, in its acknowledged excellence, is dominated by the other podophyllum structures rather than by the drastic resin.

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Resin of *Podophyllum* an isolated unity. It is a complicated educt from *podophyllum*, although all attempts to obtain from it a decomposition product or a fragment as comprehensively useful as the crude resin have as yet failed, and are likely to continue failures. The products made from it are but fragments of that "resin," which, in itself, paradoxical as it may seem in the light of past criticism of the word "*podophyllin*," is not a true resin.

The Name Podophyllin.—Dr. John King, 1835, supposing the substance he had discovered to be a true resin, named it *Resin of Podophyllum*. But when it finally crept into general use, this title seemed, to others, too cumbersome.* Consequently the first commercial lots of Resin of *Podophyllum*, placed on the market (1847) in one-ounce vials, were under the terse name "*Podophyllin*." (See Lloyd Library Bulletin No. 12.) This name was bitterly assailed by Dr. Squibb† and Professor Proctor, on the ground that the substance was a true *resin*. Their argument has since been shown to be incorrect, because "*Resin of Podophyllum*" is *not* a resin.

Had the advice of Dr. King been taken, the *definite* resins would alone have been called *resins*;‡ the *oleo-resins* would have been called *oleo-resins*, and the alkaloids would have been called *alkaloids*, their names terminating with the syllable "*ine*," or "*ia*," whilst dried extracts would have been called *extracts, dried*. But the care of Dr. King and his systematic co-laborers was not effectual in controlling either the nomenclature or the composition of the many incongruous substances that, in rapid succession, between 1847 and 1860, were, by manufacturers of plant preparations, thrown on the American drug market under the titles "*Alkaloids*" and "*Resinoids*."

Enlarged Use of the Termination *in*.—Closely following the commercial introduction of the "*Resin of Podophyllum*," under the condensed name "*Podophyllin*," and eleven years after King had established its energetic cathartic nature, came the introduction of many other substances, some of similar, resinous natures, others markedly different. Among the most typical of the resins, and once conspicuous by reason of the hope that it might carry the cathartic and other

* The tendency at that date, in both commerce and the profession, was toward single names, usually terminating with "*in*" or "*ia*," as applied to the energetic compounds obtained from drugs. The termination *ia* was applied to organic bases of alkaloids, of which *Morphia* and *Quinia* may be cited as examples. King, as was true of others at that date, thus used *ia* as an alkaloidal termination.

† See Drug Treatise No. XX, pages 9 and 10.

‡ Substances thrown from alcoholic percolates by water. They were seldom, if ever, true resins, but no better nomenclature is even now possible.

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qualities of the crude drug from which it was evolved, was that derived from *Leptandra virginica*.* This, as finally established and used by King, was a dried hydro-alcoholic extract, and by manufacturers was called *Leptandrin*. Concerning it, in reply to a question, Dr. King (1880) wrote as follows:

Cincinnati, Aug. 5th, 1880.

Prof. John U. Lloyd,

Dear Sir:

In reply to your request desiring me to give you a statement concerning the origin of the article designated by the term *Leptandrin*, I will observe that in the year 1840, I first prepared an extract from the *Leptandra virginica* root, by forming an alcoholic tincture, and an aqueous infusion subsequently; these I evaporated separately to dryness, pulverized them and mixed them together. In the *Western Medical Reformer*, of April, 1846, published at Cincinnati, pages 175 to 178, will be found a communication relative to this subject, in which paper I also called attention to the resins of Blue Flag, Black Cohosh, *Podophyllum*, etc., as well as to preparations of several other medicinal agents. Previous to this communication these resins and preparations were unknown to pharmacists and physicians; and it was a year or two subsequently, before any pharmacist ventured to prepare them for the medical profession. But, I would remark here, that in 1844, in another journal, I had called attention to the resins above referred to, which, however, attracted but little notice. I know of no earlier publication concerning these remedies, and, as, in such matters, dates give priority, should such publication be found, my claims will become valueless. As to the ~~name~~ nomenclature given to these resins and dried extracts, it did not originate with me.

Yours Truly,
Dr. King

This facsimile is presented to show the copperplate beauty of Dr. King's handwriting.

August 6, 1880.

Prof. John Uri Lloyd,

Dear Sir,—In reply to your request, desiring me to give you a statement concerning the origin of the article designated by the term *Leptandrin*, I will observe that in the year 1840 I first prepared an extract from the *Leptandra virginica* root, by forming an alcoholic tincture, and an aqueous infusion subse-

* Dr. King, its discoverer, subsequently demonstrated that this resin was practically inert. This, to him, was a deep disappointment.

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quently; these I evaporated separately to dryness, pulverized them and mixed them together. In the *Western Medical Reformer* of April, 1846, published at Cincinnati, pages 175 to 178, will be found a communication relative to the subject, in which paper I also called attention to the resins of Blue Flag, Black Cohosh, Podophyllum, etc., as well as to preparations of several medicinal agents. Previous to this communication, these resins and preparations were unknown to pharmacists and physicians; and it was a year or so subsequently before any pharmacist ventured to prepare them for the medical profession. But I would remark here, that in 1844, in another journal, I had called attention to the resins above referred to, which, however, attracted but little notice. I know of no earlier publication concerning these remedies, but as in such matters dates give priority, should such publications be found, my claims will become valueless. As to the nomenclature given to these resins and dried extracts, it did not originate with me.

Yours truly,

John King, M. D.

Rapid now was the movement of the "resinoid, alkaloid" makers. Within a brief period, between 1850 and 1855, several manufacturers of medicine were rivaling each other in their efforts to establish both priority and superiority for their special makes of the respective resinoids, concentrations, and alkaloids.

Nor were the united efforts of King and others earnestly concerned in Eclectic therapy and reform medicine capable of preventing, or for a time, even, modifying the marvelous and too often unfounded claims made in behalf of the therapeutic virtues of the so-called active principles. A resinoid craze arose, similar to other professional distempers and fanaticisms, such as the American elixir craze of the '70's, the blue-glass, sunshine craze, the Bergeon sulphuretted-hydrogen "cure" for consumption, the Brown-Sequard Elixir of Life monstrosity, the animal serum fads of the present day, or the now popular scheme of standardizing the remedial qualities of agents employed for the cure of humanity's diseases, by reason of their power to kill, or physiologically affect, animals that are never afflicted with like diseases. These and other similar fads that have plagued "Regular" medicine have successively swept over the country, dominating for a time leading authorities as well as enthusiastic novices, and have easily entrapped very many hopeful, confiding physicians and pharmacists of the present and the past.*

* Let it not be understood that we would presume to condemn the efforts made by experienced, self-sacrificing, earnest men, who, with the object of bettering conditions, involve themselves in what will surely be referred to, in a future day, as heinous fallacies or grotesque fantasies. Their efforts show that they too well appreciate the fact that conditions about them need bettering. Nor would it be just to ourselves to permit any one to presume that we believe such fallacies are necessarily fruitless. (Probably each comet that streaks the sky leaves a bit of dust that somewhere, some time, becomes useful.) The injection of sulphuretted hydrogen, per rectum, as a cure for consumption, led men to question the infallibility of some authorities, who spoke "by authority," made so by position. The cruel vivisection methods of present investigation are leading men involved in other long-established

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In this turmoil (see Lloyd Library Bulletin No. 12) Dr. King and other Eclectics were most unfortunately and unhappily embroiled, and that, too, not without reason, from the fact that Dr. King had introduced the Resin of Podophyllum and others similar. This, added to the fact that these popular "Eclectic Remedies" were making inroads on medicines from abroad,* led professional antagonists and those connected with foreign drug affairs, together with men who did not care for fact or were not inclined to investigate, as well as those who believed that independent investigation should at all costs be prevented, to attempt to saddle upon King the whole heterogeneous mass of conglomerates grouped under the name "Concentrations," and thus to discredit him and suppress the products. As a result of this, men who did not read carefully or who were unacquainted with either King or his ideals, or were prejudiced beyond reason, were led to blame him for what others, over whom he had no control, and whose methods were directly opposed to his, were doing. A bitter ending it was to the hopeful dream of that self-sacrificing philanthropist and scholar!

Concerning this phase of the subject, Dr. Alexander Wilder wrote us as follows:

So far as the exploiting of "Concentrated Remedies" and the whole array of these peculiar extracts is concerned, the endeavor to throw a responsibility on Dr. John King, beyond the three preparations known as Podophyllin, Macrotin, or Irisin, is without warrant. Dr. King was too careful to go faster in such matters than he felt that his footing would be safe. He was simply an expositor of the few substances that he had discovered, and had neither disposition nor interest in foisting upon the confidence of his medical brethren, or the public generally, a large number of the "new remedies" that he had neither discovered nor tested.

Can the dilemma of Dr. King be more forcibly emphasized than

barbarisms to abandon their systems of medication. Dr. Osler, as a heretic, had cause for his heresy, even though he outclasses some "Irregulars" in his questionings of old-time medicines and methods once considered the *only* scientifically "Regular." Even the blue-glass theorist led many physicians to think of sunlight as a remedial agent. The Rochester (New York) State Hospital is now (1909) instituting a "sun room," described by the Rochester *Democrat and Chronicle* as follows: "Extensive improvements are under way at the State Hospital which will add to this very large State institution for the insane a number of conveniences. A sun room is under construction adjoining the building in which some of the special cases are confined. At present these patients are confined within brick buildings not of the modern type. The new building will be fifty-three feet in length, twenty feet in width, and two stories in height. The roof will be of slate, but the sides will be of glass, allowing the rays of the sun to enter from the east and south. Galleries will be constructed, so that the patients will be able to get sun baths without being given undue liberty."—*Dem. and Chron.*, July 22d.

* The commercial phase of the problem must not be overlooked. Europe supplied jalap and resin of jalap (coming from Mexico to London, thence to America); calomel at that time was imported from England, as were Spanish flies from Spain through London. These and such as these were being rapidly displaced by the new remedies.

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by quoting his own words of protest against the imposition of the so-called Eclectic alkaloids, resinoids, and concentrations, written in the very height of the enthusiasm that had arisen in the Eclectic school in their behalf? (See Lloyd Library Bulletin No. 12.)

Concentrated medicines: I have been accused of unjustly opposing these remedies, and discrediting them to the profession. I confess to having opposed the principle that all the agents of our indigenous materia medica would yield their virtues in the form of a *powder*, and I still continue in the same belief. —*Dr. John King, editorial in the Eclectic Medical Journal, Vol. XXI, p. 96, 1862.*

To this may aptly be added the far-reaching paragraphs of Dr. King in the Preface (pages 9 and 11) to the American Dispensatory, 1870:

The only point to be regretted is that many worthless so-called "concentrated preparations" have been presented to the profession, purporting to be those of American Medical Reformers, and which have been gotten up by either ignorant or unprincipled parties, for the *sole* purpose of realizing wealth. The failure of these worthless articles to effect beneficial results in the treatment of disease might lead many to reject even those of value; which consideration alone has elicited the above remarks. . . . It is well known that many of these preparations, from which the manufacturers have, in some instances, already realized immense wealth, are valueless, or nearly so, while others again are downright impositions; for what chemist can believe in the reduction, for instance, of an active medicinal oil to the condition of a powder, without having its medical power more or less destroyed by the process for such reduction, even were the operation a mere trituration of the oil with some absorbent powder?

Commercial History of Concentrated Remedies.—Dr. John King, as repeatedly stated, discovered the Resin of Podophyllum in 1835. (See Lloyd Brothers' Drug Treatise No. XX and Bulletin of the Lloyd Library No. 12). Being a physician, he did not concern himself in commercial problems, and made no effort towards the exploitation of the remedy in other than in a professional or a scientific way. In like manner Dr. Isaac Jacobs, of Bangor, Maine, as early as 1835, made for his own practice dried extracts which he called "Concentrated Medicines." These antedated the commercial "Concentrations" by about sixteen years, but Dr. Jacobs never placed them on the market. In 1847 the Resin of Podophyllum, the pioneer in this line, was introduced to commerce by Mr. William S. Merrell, and soon after (1851) Dr. William Elmer, of Auburn, N. Y., and others in Syracuse, N. Y., began the manufacture of "resinoidal" products. Dr. Elmer did not favor Auburn as a business center, and soon moved to New York City, where, early that spring, under the firm name of Keith and Elmer, he established the first "Concentration" business in that

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city. Other manufacturers now entered the field, Dr. Hosea Winchester, of Missouri, who migrated East for that purpose, being the second to begin the alkaloidal-concentration business in New York City. The principal Western manufacturers of that date were F. D. Hill & Co., Cincinnati; Union Drug Store (W. S. Merrell & Co.), Cincinnati; Wm. H. Baker & Co., St. Louis; T. C. Thorp (now Lloyd Brothers), Cincinnati; Geo. M. Dixon, Cincinnati; H. H. Hill & Co., Cincinnati; and Tilden & Company, Lebanon, N. Y. All of these firms listed their products under various titles, such as Alkaloids, Resinoids, Resins, and Concentrated Medicines, some even attempting to group or classify the various substances. But, as a rule, no attempt was made to distinguish between useful agents and those questionable, or between the unworthy and those entitled to a systematic position, by legitimate scientific nomenclature.* Through journals and circular prints the physicians of America were now flooded with literature more or less extravagant concerning the marvelous alkaloidal and resinoidal remedies, the outcome being that the few worthy members of the group were soon overshadowed by others either unworthy of the name or entitled to no legitimate home anywhere. A heterogeneous collection was that which was finally included in the commercial lists of resins, resinoids, alkaloids, and concentrations, a list that stands yet in current catalogues. But, as has been said, the odium of it all rested, unfortunately, on the Eclectic school of medicine, by reason of the origin of the first of these products, the Resin of Podophyllum, and a few other worthy members introduced by Dr. King, as well as from the fact that many over-enthusiastic Eclectic physicians had been entrapped in the craze.

The Discrediting of the Concentrations by Eclectics.—

Then it was that Dr. John King, who had discovered the first of the resins, and who had been so enthusiastically hopeful in their behalf, roused by the frauds and the illogical unfounded claims now being made in this direction in the name of Eclecticism, found it necessary to deal the deathblow to these products, which was accomplished, so far as the Eclectic school of medicine was concerned, by his crushing communication to the *Worcester Journal of Medicine* (Eclectic), June, 1855, from which we abstract as follows:†

* A substance may have no scientific home, and yet be of exceeding therapeutic value. See page 27.

† Will history repeat itself as regards impositions in the direction of unworthy serums, toxins, antitoxins, animal extracts, gland juices, and such, now a fad in a direction Eclecticism has escaped responsibility? Will any medical authority of the Allopathic school have the courage to face the issue when the worthy few of this class become smothered by the unworthy multitude? Has the "Regular" school a John King?

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"I now wish to call the attention of all classes of physicians to a most stupendous fraud which is being perpetrated upon them in relation to concentrated preparations, in which oils, oleo-resins, fluid extracts, etc., are triturated with finely powdered green leaves, or roots, or barks, perhaps of the crude articles of which they purport to be concentrations, as well as with rosin, carbonate of magnesia, etc. The resin of jalap which can be obtained for two dollars a pound, is triturated with some inert agent, and sold for Jalapin at one dollar an ounce; and similar impositions. . . .

"I regret that I am compelled to thus definitely allude to these matters, but there is no help for it—the cause of Eclecticism, of truth, of justice, demands it. Already are the old-school physicians manifesting an interest in our concentrated remedies, and if we permit such trash to be foisted on them as pure agents, they will believe that Eclecticism is indeed quackery and humbug, and it will require years to overcome the effects of such a disgraceful blow. We have sufficient to do in contending for the truth and justice of our cause, without warring against the imposition of those who either directly or indirectly claim to be with us.

"I am sorry to say some individuals have been found so far regardless of the good of the cause, and their own honor, as to have made strenuous efforts to introduce these agents to the profession by all the means in their power.

"I shall make no comments on the subject; it speaks for itself with the voice of a stentor, and every honorable man, every true Eclectic, can not but feel its voice enkindling within his whole soul the strongest feelings of censure and indignation toward those who would thus deceive the profession in a matter so intimately connected with the health and lives of their fellow creatures."—*John King, 1855.*

Simultaneously with this attack of Dr. King, Professor Edwin S. Wayne, a talented pharmacist of Cincinnati, chemist of the renowned Ohio Medical College, contributed a four-page paper to the *American Journal of Pharmacy*, exposing the alkaloids, resinoids, and concentrations made by the American Chemical Institute, of New York. While Professor Wayne primarily attacked the sophisticated compounds, he also, in a logical way, opposed the dogma of a single principle being capable of paralleling a plant as a whole, or even being competent to carry the qualities of a natural textural structure obtained therefrom. He also took pains to *credit* the Eclectic school with the authoritative work it had accomplished, a refreshing innovation seldom found in the literature of the dominant school of those days. We quote as follows:

"To the physicians of the Eclectic school much credit is due for their efforts in investigating our indigenous *materia medica*, and through their efforts many substances have been brought into use. These, though of much value, may again fall into disuse, simply because these resins have been said to be their active principle, without any further examination, and when tried, found to be wanting, the manufacturers having thrown away the pearl and retained only the shell."

Professor Wayne then goes on to state facts indisputable, which Dr. King had for twenty years so faithfully observed in his advice and methods, to wit:

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"These resins have been claimed as an advance in pharmacy. For my part I can not perceive it. The fact that plants contain a resin is not new; neither is the use of them medicinally. It is an easy method of obtaining a something, to be called the active principle; and in most instances they will be found to contain but little, if any, of the medicinal value of the substances they may be obtained from, being far more inferior than a common extract, and much more expensive. . . ."

"And to the pharmacutists engaged in the manufacture of concentrated remedies, I would recommend that they make an analysis, and have the results tried, before they decide that the resin is the active principle, and cry 'Eureka, I have found it!'"

From this date the controversy became vicious and personal, Eclectic and other medical literature being burdened with bitter discussions. Manufacturers of these products increased in number, and in a spirit of rivalry indiscreetly expanded their lists until the number of items included among the concentrations far exceeded reason, if proximate plant constituents, as intended by their originators, formed the basis. Under such influences the crusade of disfavor continued with repeated attacks, chiefly now from within the school to which they owed their origin. Of such, the following, from the conspicuous Eclectic authority, Professor John M. Scudder, M. D., is an example:

"In 1855 much of Eclectic medicine was an unmitigated humbug. That was the day of the so-called concentrated medicines, and anything having a termination in "in" was lauded to the skies. It was claimed that these resinoids were the active principles of the plants, and as they would replace the old drugging with crude remedies and teas, they must prove a great boon. But they did not give success, and finally, after trying them for awhile, the practitioner would go back to the crude articles and old syrups and teas with success, or he would settle down to podophyllin catharsis and quinine."—Editorial by John M. Scudder, M. D., Eclectic Medical Journal, March, 1870.

To this may be added such expressions as the following, from a series of articles titled "*Pharmaceutical Chemistry*," 1875, in which the writer thus refers to the substances under discussion:

"I have commenced this series of articles with the opinion that unless we go over and examine into the peculiarities of the complex elementary bodies that constitute medicinally the bone and sinew of our crude plants, many of us will in no wise be in circumstances either to understand clearly the nature of the pharmaceuticals themselves, as they are, or the nature of the pharmaceuticals as they should be. . . . Again I desire particularly not to have the term alkaloid, as used by me, confounded and connected with a certain line of stuffs called indiscriminately by the several names of resinoids, concentrated medicines, and alkaloids, for never, under any circumstances, do I even refer to these nostrums as medicines."—John Uri Lloyd, Eclectic Medical Journal, May, 1875.

Finally, with a few exceptions, such as the Resin of Podophyllum and the alkaloidal salts of hydrastis and sanguinaria, came the utter

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neglect of these products by the Eclectic profession in behalf of the kindlier system of medication and the more rational ideas of therapeutics that came in the advent of Dr. John M. Scudder.* The few items now employed are used in very small doses, in specific directions, which, as a rule, are constantly decreasing. But their commercial importance did not greatly suffer by the loss of the Eclectic patronage, for about the date of their discrediting in Eclecticism they passed into the hands of pill makers and proprietary formula compounders, and the physicians who believed in heroic dosage. But even with these people only a few items have now any standing whatever, although it can not be denied that these few are most heroically and extensively prescribed and in proprietary physic most freely swallowed.

The English Euonymin Craze.—A quarter of a century after the resinoids of America received their deathblow at the hands of the Eclectics, a peculiar craze for *Euonymin* struck England. The American manufacturers' lists quote two colors of the drug (see page 25), one green and the other brown. These two forms came into English demand, and owing largely to their exploitation by the celebrated Dr. Richardson, of London, so great was the "Euonymin" craze in that country that within a brief period American resinoid makers were overwhelmed with orders.† The root, root-bark, shrub, and the shrub-bark supplies of the crude drug employed for their manipulation became exhausted, whilst the price of all forms of the crude drug doubled and trebled. We know of single orders from London for one thousand pounds, each color of Euonymin, quick delivery. From 1885 to 1890 the English Euonymin craze was at its height, and during those years the English pharmaceutical and medical press teemed with articles concerning the wonderful remedy! The various Euonymins were examined for ash, and the old question of inorganic admixture was naturally revived, especially with the green-colored drug, where aluminum hydroxide is likely to be employed to precipitate the chlorophyl-bearing structures and associated materials from the evaporated alcohol extract, said hydroxide contaminating the product. (See Note C, page 28.) It was even reported that one lot of Euonymin contained much barium carbonate, a statement difficult to accept!

* Nor was this all that came then to simplify and to better medicines and their application. The compounds of old, the conglomerates of that period, the "shotgun" system of practice was entrenched even more firmly than the "concentrations." But this phase of the subject can only be alluded to now.

† Dr. Richardson is noted also as having "discovered" the value of the old Eclectic remedy, *Gelsemium*, long after it was established and in great use in that school. But he added nothing new to its therapeutic applications.

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Numerous were the questionings and explanations naturally asked and offered, but in it all no one apparently thought to refer to Eclectic literature of the past, where, half a century before, the whole subject of the alkaloids, resins, resinoids, and concentrations, in all its phases, had been discussed in detail, and thrashed out to a finish. So it was that history *unnecessarily* (as is too often the case with people who read only their own literature) repeated itself, events in England, but on a smaller scale, following in nearly the track of the old alkaloidal-resinoidal-concentration epoch in America.

As abruptly as it began did the English concentration fad terminate, leaving but a few energetic resinoids, such as King's Resin of Podophyllum (representative of the class), still used in England, as it is both used as well as abused to-day, in all parts of the civilized world, as is shown in current pharmaceutical and therapeutical literature. (See Lloyd Brothers' Drug Treatise No. XX.)

The Lesson. — Comes now the lesson taught by the half century of turmoil in and among the alkaloids, resins, resinoids, and oleo-resins. Shattered ambitions, blasted hopes, disappointments generally, have their uses. The resinoid craze is not an exception, for it has already served several purposes, one being the establishing of the fact that in only a few North American drugs are found either alkaloids or resins of great individual merit, another being the dispelling of the illusion that a fragment can parallel the whole, if the whole be intelligently comprehended. Eclectic physicians learned from an experience not easily forgotten the lesson that—

Dried Fragments of Drugs are not Representatives of Drugs.—An experience of more than three decades, commencing in a craze for energetic, or even poisonous, proximate principles, had, as already related, taught Eclectic physicians to their own satisfaction that a toxic constituent or a mixture of the separated dried products broken out of a drug by chemical means or created from drugs by the chemist's art, useful though each might be in its own sphere, did not typify or parallel the therapeutic qualities of the whole drug. They had learned by bitter experience that a poisonous fragment or ultimate, broken out of or created from a plant by chemistry, did not represent the therapeutic qualities of the structure from which it was derived. The once prevailing hope that a single, dominating constituent, or ultimate, or a definite substance present in, or obtained from a drug, could be taken to standardize the desirable therapeutic qualities of the combined medicinal parts of a plant complexity, also passed away. In the latter days of King and Newton and in the

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coming prime of Scudder's efforts, heroic doses of shock-producing remedies became exceptions in the practice of Eclectics. The administration of violent ultimates and large doses to shock the system, even as regards active cathartics (now most discreetly used, when used at all, in Eclectic medication), gave way to kindlier methods. The doctrine of humanity to the disease-weakened sufferer, not brutality to the helpless, once more revived and became not merely ideals in theory, but logical facts in a successful practice. The original Eclectic motto, "*Vires Vitales Sustinete*" (Sustain the vital forces), so often lost to view by some people involved in the fallacy of the nineteenth century alkaloidal-resinoidal ultimates, became, as in the days of the fathers, a legitimate Eclectic watchword. By a final, natural *evolution* the school, after facing disaster, passed safely through the crisis of the alkaloidal-resinoidal craze of the sixties in the century that has passed.

The Present.—At present, instead of overdoses of toxic ultimates, the trend in Eclecticism is toward greater questioning and conservatism than ever concerning vicious or possibly harmful medication. The old-time "Concentrations" have most of them been long since abandoned, displaced, or discredited as undesirable types of remedial agents. No longer are they sought as though they represented complex drugs. Small doses of kindly remedies, established by clinical study in disease, administered for curative action, not systemic shock, now universally prevail. The non-poisonous remedies, made of innocuous drugs, are now sought and are administered with a degree of therapeutic satisfaction unknown in past heroic dosage. Substances energetic or toxic, when used, are employed most cautiously and conservatively; small doses often repeated being the rule. The resins and alkaloidal salts of old, such as the sanguinarine compounds, are sometimes, but not often, prescribed; when prescribed, being in minute doses. Drug representatives such as plant textures and complexities, the poisonous constituents of which were considered as the standards of curative qualities by Eclectic pharmacists fifty years ago, and accepted as such by Eclectic physicians in the day of past evolution, are no longer therapeutic favorites, unless they are partially, or even wholly, freed from their toxic constituents. Such as opium and morphine were never Eclectic favorites, and now are most tenderly employed when employed at all, while a liquid *nux vomica* preparation, in which strychnine is in minor proportion to other constituents, is now the favorite Eclectic form of the drug.* Thus the Eclectic methods of

* Strychnine should not exceed one-fourth the total alkaloid in a *nux vomica* preparation. Nor will it, in the Specific Medicine, after this date.

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medication and the Eclectic remedies are, to-day, in marked contrast to those demanded under the ideas that yet prevail among physicians who believe that a remedy must be established in therapy from the toxic or physiological side, or who accept that therapeutic usefulness is in proportion to the poisonous viciousness of a drug. So great has been the advance among Eclectics in this direction that, as already intimated, even the preparation *Resin of Podophyllum*, once exclusively Eclectic, and originally employed as a drastic cathartic, has passed almost completely from Eclecticism into the practice of physicians of opposite ideals from those now prevailing in the school of its discoverer.* Concerning the revolution the half century has wrought in the therapy of the energetics once so freely used in Eclectic practice, among which Resin of Podophyllum was typical, Professor Felter, in the *Eclectic Medical Journal*, July, 1909, thus tersely expresses the facts:

"Podophyllum and its resins are now seldom employed in physiologic doses by Eclectic physicians; but as remedies, in small doses, to gently stimulate intestinal secretions, they have steadily grown in favor."

Retrospective.—We have thus briefly referred to incidents and events connected with the discovery and introduction of the "Concentrations," as well as to the passing out of the substances that, as a fad or craze, more than half a century ago, came perilously near disrupting the Eclectic school in medicine. A less abridged history of these events, together with more detailed reference to literature and authority, is to be found in the Bulletin of the Lloyd Library, No. 12, from which the statements in this Drug Treatise are largely abbreviated and condensed, and to which persons interested are referred for voluminous references and more specific data.†

Out of it all came the introduction of a few resins and a few alkaloidal salts of American plants, but yet these few, introduced into the Eclectic school over half a century ago, comprise all of any importance whatever that are to-day used by any class of physicians.‡ In this connection, to close this chapter, we can well introduce the translation from a French publication of an article by the talented scholar, Dr. Charles Rice, chairman, for three decades, of the Committee of Revision of the Pharmacopœia of the United States.

* In our opinion, the rank and file of the dominant school are not so firmly bound to the *poison or shock* treatment as a few believe who think they speak for the profession, and are enthusiastic in that direction. We have reason to believe that, unless conservatism among the managers prevails, a revolution will yet come in their ranks, as it did in Eclecticism.

† Bulletin No. XII, Lloyd Library Series, can be obtained as long as in print, by enclosing \$1 to Librarian, Lloyd Library, Cincinnati, Ohio.

‡ Strange that in a flora of over 12,000 species this should be true. On this phase of the subject we shall write more fully hereafter.

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The Eclectics form a class of physicians who reject the use of a large number of remedies of mineral origin, and particularly of all mercurial compounds, and replace them by vegetable remedies, chosen as much as possible from among indigenous plants. It is certain that the persevering and careful study that the adherents of this school have made of the action of several American plants has been very profitable to medicine in general. The regular profession never hesitates to make use of the truly useful among those discovered, whoever be the authors, but the system is very justly repudiated by the medical profession, because it is based upon a dogma. Many plants of which the Eclectics alone first availed themselves have ended by becoming the common property of the entire medical profession; every practitioner has, and ought to have, the inalienable right of employing every therapeutical agent, provided it be not a patented or secret preparation, which he considers useful to his patient, whether the pharmacopœia has adopted it or not. But from the moment that a preparation is presented under the character of a special remedy, when its formula is unknown and kept secret, in such a manner that its preparation is monopolized by a particular firm or its composition can not be controlled by every pharmacist or physician, it should be proscribed. But such is not the case with the Eclectic preparations. Although I, like the majority of pharmacists and physicians, am not in accord with the Eclectics, from the standpoint of their theories, I must recognize the fact that they do not surround themselves with mystery; like the homœopaths, they have their pharmacopœia, represented by the following work: *The American Dispensatory*, by John King, M. D., 8th edition, Cincinnati, 1878.

Whatever opinion one may have regarding the ideas defended in this book, one can not but discover that it constitutes a precious encyclopedia of medical American plants, and their therapeutical uses. It is a very useful work for reference. Its author is as fine a botanist as a judicial observer of therapeutical effects.*—Translation of pages 9 and 10 of Dr. Charles Rice's "*Note sur Certains Medicaments Vegetaux Americains*."

*To this we will add that the ideals and the efforts of the Eclectic profession were very highly appreciated by Dr. Rice in his latter days, as this writer can authoritatively testify.—J. U. L.

PART SECOND.

COMMERCIAL CONCENTRATIONS OF 1909. (ALKALOIDS, RESINS, OLEO-RESINS AND RESINOIDS.)

Notwithstanding the aforementioned remarkable record, some of the concentrations are still used in considerable amounts in legitimate therapy, as well as by private formula compounders. Many physicians employ established formulas containing them, while others use them singly or in favorite prescriptions, as occasion suggests. Old works on therapeutics carry them in many compounds still desired by some physicians who read after the old authors, whilst the makers of pills and tablets for home cure of disease, proprietary medicine makers of popular cathartics, etc., etc., employ such substances as podophyllin in immense amounts. Probably no substance, not excepting jalap, is more vital to the makers of cathartic proprietaries than is "Podophyllin." For this reason manufacturers of such plant preparations continue supplying the "Concentrations" to such physicians and mixers of medicines as yet employ them. The aforementioned explanations, and the statements that follow, especially the brief notes after the two lists offered (pages 28-31) are sufficient to introduce and permit of intelligent comment on the items in the prices current. Especially do we commend to the reader's attention the remarks and the notes that follow the lists, which are essential to the completeness of this number of our series of Drug Treatises.

Concerning Present Concentrations.*—The house of Lloyd Brothers, the successors of Dr. T. C. Thorp, one of the manufacturers of the early Eclectic Concentrations (1852), continues to manufacture these concentrations. From the 1887 *Prices Current* we reproduce the general suggestions and definitions therein, which are necessary in relationship to our preceding statements.

Many years ago, under the name "Resinoids," this class of preparations was introduced to medicine. As a rule they were not of definite composition, few being distinct enough even to classify. So they were afterwards more properly called concentrations. They represent such materials as resins, glucosids, alkaloids, etc., the aim having been to produce concentrated powders of the various drugs.—*Lloyd Brothers' Prices Current, 1885.*

* See Lloyd Library Bulletin No. 12.

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The general label used at that date and subsequently may well be reproduced as a matter of record.

These preparations were introduced more than half a century ago by the Eclectic school in medicine. They embrace a few definite compounds, as the alkaloids of Hydrastis and Sanguinaria; a few energetic resins, as of Podophyllum and Macrotys, and a few so-called oleo-resins, such as those of Iris and Capsicum. The remainder are less definite, and have no scientific home. This much-abused class of substances served a temporarily useful purpose in the evolution of a more perfect materia medica. They are mainly relics of a primitive pharmacy, struggling amid error and uncertainty. We would not have a patron purchase a remedy we make under a misapprehension, and we therefore state that long since the majority of these bodies have been viewed by us as representatives of a pharmacy that is practically obsolete, and properly so. Believing that our position as manufacturers makes it a duty for us to thus candidly express ourselves to a patron, and realizing, furthermore, that no conscientious manufacturer of repute will disagree with the facts, or can expect to supply better products than our list embraces, we assume that our responsibility ends with this statement of fact.—*From Lloyd Brothers' Prices Current, 1885.*

The listed items in the catalogue to follow are necessarily arranged alphabetically.*

TABLE OF CONCENTRATIONS.

(With Notes.)

INCLUDING "RESINOIDS," ALKALOIDS, ALKALOIDAL SALTS, ETC.

(For explanation of reference letters A, B, C, etc., see NOTES pp. 28-29.)

	Price per ounce. Bottle included.		Price per ounce. Bottle included.
Aletrin	A, ... \$0 50	Cerasin, (Prunin)	A, ... \$0 60
(from Aletris farinosa)		(from Prunus virginiana)	
Alnuin	A, ... 60	Chelonin	A, ... 1 00
(from Alnus serrulata)		(from Chelone glabra)	
Ampelopsin	A, ... 65	Chimaphillin	A, ... 80
(from Ampelopsis quinquefolia)		(from Chimaphila corymbosa)	
Apocynin	A, ... 1 00	Chionanthin	A, ... 1 00
(from Apocynum cannabinum)		(from Chionanthus virginicus)	
Asclepinin	A, ... 80	Cimicifugin (Macrotin) B, ...	50
(from Asclepias tuberosa)		(from Cimicifuga racemosa)	
Baptisin	A, ... 80	Collinsonin	A, ... 1 00
(from Baptisia tinctoria)		(from Collinsonia canadensis)	
Barosmin	A, ... 80	Colocynthin	A, ... 1 00
(from Barosma crenata)		(from Citrullus colocynthis)	
Betulin	A, ... 1 60	Cornin	A, ... 60
(from Betula alba)		(from Cornus florida)	
Caulophyllin	A, ... 50	Corydalin	A, ... 1 00
(from Caulophyllum thalictroides)		(from Corydalis formosa)	

* Such alkaloids as Cocaine, Esarine, etc., came after this date. Atropine was introduced in the decadence of the concentrations.

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	Price per ounce. Bottle included.		Price per ounce. Bottle included.
Cypripedin A, ...	\$1 00	Leptandrin A, ...	\$0 40
(from Cypripedium pubes-		(from Leptandra virginica)	
cens)		Liatrin A, ...	80
Dioscorin A, ...	1 00	(from Liatris spicata)	
(from Dioscorea villosa)		Liriodendrin A, ...	1 00
Euonymin, Green C, ...	1 10	(from Liriodendron tulipi-	
(from Euonymus atropur-		fera)	
pureus)		Lobelin A, ...	1 20
Euonymin, Brown A, ...	1 10	(from Lobelia inflata)	
(from Euonymus atropur-		(not the alkaloid Lobeline)	
pureus)		Lycopin A, ...	60
Eupatorin A, ...	60	(from Lycopodium virginicus)	
(from Eupatorium perfoli-		Macrocin (Cimicifugin), B, ...	50
atum)		(from Macrotyus [Cimici-	
Euphorbin A, ...	1 60	fuga] racemosa)	
(from Euphorbia corollata)		Menispermin A, ...	60
Eupurpurin A, ...	60	(from Menispermum cana-	
(from Eupatorium purpur-		dense)	
eum)		Myrcin A, ...	60
Eryngin A, ...	1 00	(from Myrica acris)	
(from Eryngium aquaticum)		Phytolaccin A, ...	80
Fraserin A, ...	60	(from Phytolacca decandra)	
(from Fraxinea walteri)		Podophyllin, Brown.....G, ...	40
Gelsemin A, ...	1 50	(from Podophyllum peltatum)	
from Gelsemium semper-		Podophyllin, Yellow.....H, ...	40
virens)		(from Podophyllum peltatum)	
Geranin A, ...	60	Populin A, ...	40
(from Geranium maculatum)		(from Populus tremuloides)	
Gossypin A, ...	1 50	Prunin (Cerasin) A, ...	60
(from Gossypium herbaceum)		(from Prunus virginiana)	
Hamamelin A, ...	60	Ptelein A, ...	1 20
(from Hamamelis virginiana)		(from Ptelea trifoliata)	
Helonin A, ...	1 50	Rhein A, ...	2 00
(from Helonias dioica)		(from Rheum officinalis)	
Humulin A, ...	90	Rhusin A, ...	60
(from Humulus lupulus)		(from Rhus glabra)	
Hydrastine (Berberine)		Rumicin A, ...	60
Yellow Alkaloid D, ...	6 00	(from Rumex crispus)	
Hydrastine (Berberine)		Sanguinarine Nitrate.....I, ...	3 00
Citrate D, ...	6 00	Sanguinarine Sulphate.....I, ...	3 00
Hydrastine (Berberine)		Sanguinarine Principles	
Muriate D, ...	5 00	Combined J, ...	65
Hydrastine (Berberine)		(from Sanguinaria canad-	
Nitrate D, ...	6 00	ensis)	
Hydrastine (Berberine)		Scutellarin A, ...	1 00
Phosphate D, ...	6 00	(from Scutellaria lateriflora)	
Hydrastine (Berberine)		Senecin A, ...	1 00
Salicylate D, ...	7 00	(from Senecio aureus)	
Hydrastine (Berberine)		Smilacin A, ...	1 60
Sulphate D, ...	5 00	(from Smilax officinalis)	
Hydrastine, Principles		Stillingin A, ...	1 00
Combined DA, ...	2 50	(from Stillingia sylvatica)	
(from Hydrastis canadensis)		Taraxin A, ...	1 00
Inulin A, ...	80	(from Taraxicum)	
(from Inula helenium)		Trillin A, ...	60
Irisin E, ...	60	(from Trillium erectum)	
(from Iris versicolor)		Viburnin A, ...	1 00
Jalapin (Resin of Jalap), F, ...	90	(from Viburnum opulus)	
(from Ipomea jalapa)		Xanthoxylin K, ...	1 00
Juglandin A, ...	60	(from Xanthoxylum fraxi-	
(from Juglans cinerea)		neum)	

AMERICAN ALKALOIDS.

REMARKS AND NOTES.

Alkaloids.—Only five North American plants established in therapy yield alkaloids in any considerable amount, viz.: Sanguinaria, Hydrastis, Gelsemium, Veratrum, and Lobelia.* Of these the alkaloids of two only, the old Eclectic Sanguinaria and Hydrastis, have ever been much valued in medicine, and these it is now known but imperfectly represent the drugs yielding them.† All the American alkaloids now employed to any extent were introduced into Eclecticism the first half of the nineteenth century.‡ To the early uses of these old alkaloidal salts nothing of importance has been added in therapeutical directions, as can be seen by a study of the past record, and contrasting it with the commended uses of the present.

Nomenclature.—We terminate the name of the *alkaloids only* with the syllable *ine*, applying the termination *in* to such indifferent substances as resins, glucosids, etc. We thus differentiate the alkaloids of the list from the members of other classes, and designate them so plainly that no confusion concerning their scientific nomenclature can exist in the mind of an intelligent reader. Let it be therefore understood that substances in the preceding list that do not in name terminate with the syllable *ine* are *not alkaloids*.

Resins.—(Listed B, F, and G.) Of the legitimate drug resins, three only—resins of macrotys, jalap, and podophyllum—are of enough importance to merit an established position in therapy. The semi-resinous products (oleo-resins, akin to oils rather than resins) of such drugs as aletris and iris have long passed into disuse, in favor of more eligible and more representative liquid products of the drugs yielding them. Scammony has never been in the Eclectic list. (See table, pages 24 and 25, and the accompanying notes.) We terminate the names of the resins and other indifferent substances with the syllable *in*.

* This appears remarkable. See Note ‡, page 21.

† About 1885 Dr. Roberts Bartholow investigated *lobeline* (as made by us), physiologically and therapeutically. It failed to equal the hopes and expectations of physicians employing lobelia, and naturally came into neglect. See *Drugs and Medicines of North America*, 1885, Vol. II, pages 89-92.

‡ The white alkaloid *hydrastine* may be excluded. It has no place in Eclectic therapy, and is perhaps the most objectionable constituent of the drug. It is a poison (see Bartholow's physiological investigations, *Drugs and Medicines of North America*, 1885, and *Bulletin of Lloyd Library*, No. 10, pages 156-161), and for that reason perhaps is taken as a standard of excellence by some physiologists. Hydrastine appeals to heroic medicationists, and in the United States Pharmacopoeia is taken as the standard of excellence. However, the most popular (with physicians) of all preparations of hydrastis (Lloyd's Hydrastis) has contained for over a decade only a very small amount of this alkaloid, and is to be preferred (as shown by experienced investigation) if it contain *none at all*.

AMERICAN ALKALOIDS.

Oleo-Resins.—In the day of the popularity of the “resinoids” it was discovered that a few substances, more or less related, partook of the nature of oils and refused to dry. An attempt was largely made to classify these and distinguish them by the affix *din*, and to supply them in liquid form. Thus, in old Prices Current and lists of Concentrations will be found such names as *Iridin*, *Pteleidin*, *Asclepidin*, and a few others. This nomenclature did not, however, prevail. These oleo-resins were never popular, and soon dropped from sight. They are, however, included in our list (pages 29 and 30), and are therein properly designated as *Oleo-resins*.

Unclassified Concentrations.—(Marked *A* in the list.) Such terms as *apocynin*, *gossypin*, *caulophyllin*, *cypripedin*, *phytolaccin*, *scutellarin*, *euonymin*, *ergotin*, etc., etc., comprise the majority of items that have no position in any scheme of scientific chemical classification. They are neither alkaloids, glucosids, resins, acids, nor anything else definite, and we contend now, as heretofore, that (regardless of therapeutic values) it is a misnomer to apply to such substances a systematic name carrying an established, scientific termination. Such preparations as these, notwithstanding the protest of the Eclectic authorities, were, however, introduced as “Concentrations” in the early history of American medicine, and were, as previously stated, included among the “*Eclectic Alkaloids, Resins, and Resinoids*.” Their names, made of the respective plant titles, were terminated with *in*.

It does not necessarily follow, however, that such substances as these are altogether useless in therapy or innocent in action. Many of the incongruous preparations associated under the foregoing titles carry more or less of the drug qualities of the plants from which they are made, whilst some that stand without the semblance of a scientific formula are very energetic. In this connection we will add that a dried extract of *nux vomica* or of *hyoscyamus* does not lose its power to kill by reason of the fact that it is mislabeled. Nor does such a substance as the old Eclectic “Concentration” *colocynthin*, that has no scientific home or rational name, by reason of its faulty title fail to act as an active physic. (See note, page 15.) On the other hand, a material capable of a definite formula may be of no significance whatever, therapeutically. Genistic acid, from gentian, is of no known use, nor has crystalline xanthoxylin any established value.

With these remarks we introduce the following explanatory notes:

AMERICAN ALKALOIDS.

NOTES TO LIST OF CONCENTRATIONS, ALKALOIDS, ETC.

(Pages 24, 25.)

A. Products thus marked are not definite compounds, nor do they accord with or permit of any scientific chemical nomenclature. They were introduced in the early days of American medicine, and were originally known as "Eclectic Resinoids," but were never advocated by such Eclectic authorities as King and Scudder. They more properly belong with the "Powdered Extracts," but each item must necessarily be made by processes peculiar to itself.

B. This, known under the two names, "Cimicifugin" and "Macrotin," is a dried, resinous precipitate (*not a true resin*), from *Macrotys* (*Cimicifuga*). It was discovered by Dr. John King about 1835 (see history), and introduced by him into general medicine about 1845. It is possessed of energetic qualities, and needs to be carefully administered. Overdoses produce violent headaches.

C. This is a precipitate from a strong alcoholic extract of *Euonymus* (*Wahoo*), by means of sodium carbonate and alum solutions. It carries an excess of alumina, as do the other "Green Resinoids," when made by this (the original) process. In 1885 it came into English use, by reason of the reports of Dr. Richardson, of London. (See page 18.)

D. These are alkaloidal salts of the *yellow alkaloid* of *Hydrastis*, known to physicians of the present day both as *Hydrastine* and as *Berberine*. This very widely disseminated alkaloid was introduced into Eclecticism and established under the proper and rational name *Hydrastine*, long before the name *Berberine* was applied to it in any medical print. We therefore continue to recognize the name *Hydrastine*, primarily, in our lists and on our label, because it is, historically as well as by priority, the proper name, as well as because it is still the title used by the majority of physicians employing compounds of this yellow alkaloid. (See Lloyd Brothers' Drug Treatise No. XXIII, page 9.)

DA. The substance known for over fifty years as "*Hydrastine Principles Combined*," was the first "resinoid" of this drug. It carries much foreign material, such as the acrid resin and other peculiar proximate principles of *Hydrastis canadensis*. The name originated when the term "resin" was all potent. This preparation is generally used when simply "Yellow Hydrastine" is prescribed, and has been sent by us to our patrons for many decades when simply "*Hydrastine*," or "*Hydrastine P. C.*" is ordered.

As a remedy for internal administration, where it is not necessary to employ a solution, we consider the "*Principles Combined*" as preferable to any single alkaloidal salt of the drug, mainly because in the experience of physicians in whose judgment we confide it is a better representative of the desirable constituents of *Hydrastis* than is any single drug product of this plant, and because it carries but little of the poisonous white alkaloid.

We consider the *white alkaloid*, ("*Hydrastine*," so-called), too violent to dominate any *Hydrastis* preparation, and for this reason we exclude it, largely, from our "*Principles Combined*." We consider it harmful, if in excess, in any established field of *Hydrastis* therapy, and we believe it should be totally excluded from all preparations intended as soothing applications, or as tonics in disturbances of the stomach.

E. This is not the oleo-resin of *Iris*, which, introduced and used under the name *Iridin*, (see page 9), over half a century ago, is now obsolete. (See "*Oleo-Resins*," page 29.)

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F. Resin of Jalap, in the early days of the Eclectic Alkaloidal-Resinoidal-Concentration excitement, was called *Jalapin*. The name is perhaps subject to criticism, but for obvious reasons, (see page 10), it is retained in our list.

G. The genuine, dark-colored Resin of Podophyllum, now official in the Pharmacopœia of the United States, is the same as that made in 1835 by its discoverer, Professor John King, M. D., and named by him, "Resin of Podophyllum." It was also the first of the line afterwards known as "Resinoids." (See page 10.) The reputation of "Podophyllin," the commercial name of the drug, was established on the use of this article.

H. "Podophyllin" of a yellow color is an alum lake, produced by means of alum or other chemicals. For apparent reasons, (commercial), that need not be stated, it once dominated the "Podophyllin" drug trade of America. Yellow Podophyllin is uncertain in its action, and is very griping. We neither make it, nor supply it. (See Lloyd Library Bulletin No. XII.)

I. These alkaloidal salts of Sanguinaria carry in acid combination the impure (mixed) alkaloids of the drug, for the root of Sanguinaria canadensis contains two or more alkaloids that are closely related to each other and have been used in natural association from the date of their introduction. These alkaloids are white, but with acids they form very acrid salts, all of which have a red color. They should be used cautiously.

J. The preparation used under the name "*Sanguinarine Principles Combined*" is a complicated form of the alkaloid, being a precipitated mixture of crude, alkaloidal compounds, resins, and other products of Sanguinaria. It is a powder having a buff or bluish-gray color, which changes to red when moistened with a sour acid. The Sanguinaria alkaloids and all their salts are exceedingly irritating to mucous membranes, and the inhalations of their dust are to be avoided as much as possible.

K. The bark of Xanthoxylum (Xanthoxylum americanum) contains a white, crystalline glucosid of no ascertained medicinal value. The old-style "concentration" furnished under the name "Xanthoxylin" has been employed by physicians of repute for over half a century. It contains other principles of the bark, together with the aforehamed glucosid, Xanthoxylum, which, in our opinion, as already stated, is not of importance.

OLEO-RESINS AND OILS BY ETHER.

Among plant preparations long established are the extracted Medicinal Oils, known also as Oils by Ether (improperly Ethereal Oils),* and the Oleo-resins. These are complicated and often very concentrated solutions of energetic principles of the plants yielding them, but are not distillates, such as are the Essential Oils. A few, such as Oil of Lobelia, Oil of Stillingia, and Stillingia Liniment (which we include in the list), are very popular, and justly so, because they

* Oils by Ether are made by extracting drugs by means of Sulphuric Ether, which, by evaporation, leaves a fixed oil and other ether-soluble products. An *Ethereal Oil* is a *volatile* or *essential* oil, obtained usually by distillation.

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are very useful and have been long established as remedial agents. Others, such as Iridin and Pteledin (marked A), are obsolete Eclectic oleo-resins made after the method of preparing Resin of Podophyllum. They are mixtures of vegetable oils, resins, chlorophyl, and dissolved substances, the oleo-resins predominating. Oil of Male Fern, a European preparation akin to the oleo-resins, is included in the list, as is also the invaluable old, standard, Stillingia Liniment.

TABLE OF OLEO-RESINS AND OILS BY ETHER.

With Notes.			
	Prices per ounce.		Prices per ounce.
Aletredin (Oleo-Resin) ..A, ..	\$0 75	Oil Capsicum	B, .. \$0 60
(from Aletris farinosa)		(from Capsicum annum)	
Asclepedin (Oleo-Resin) ..A, ..	75	Oil Lobelia	C, .. 90
(from Asclepias tuberosa)		(from Lobelia inflata)	
Eupurpurin (Oleo-Resin) ..A, ..	75	Oil Male Fern	22
(from Eupatorium purpureum)		(from Male Fern, Dryopteris filix-mas)	
Heledin (Oleo-Resin)	A, .. 75	Oil Stillingia	D, .. 80
(from Helonias dioica)		(from Stillingia sylvatica)	
Iridin (Oleo-Resin)	A, .. 75	Stillingia Liniment	E, .. 25
(from Iris versicolor)			

NOTES ON OILS AND OLEO-RESINS.

A. These are natural mixtures of fixed oils and resins in which are dissolved characteristic principles of the drugs from which they are obtained. The paragraph introducing them (pages 29 and 30), together with other preceding references, is self-explanatory.

B. Oil of Capsicum. (*Am. Disp.*)—This is a very powerful preparation and must be very carefully employed. Is is an active stimulant and may be added to liniments, poultices, etc., whenever excessive stimulation or rubefaction is desired. It is too active for use as an internal remedy, except in very small doses, not in excess of one drop, and then should be largely diluted with syrup. A similar preparation is official in the United States Pharmacopœia under the name Oleoresin Capsicum.

C. Oil of Lobelia.—"One drop of the oil triturated with one scruple of sugar, and divided into from six to twelve doses, will be found highly useful as an expectorant, nauseant, sedative, and diaphoretic, when given every one or two hours, as may be required. As a local application, much benefit may be derived from it where a particular nerve is to be quieted or a muscle to be relaxed. An excellent liniment may be made of a mixture of half an ounce each of oils of amber and sassafras, a drachm of oil of lobelia, and half a drachm of oil of capsicum."—*Am. Disp.*

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D. Oil of Stillingia.—This is an Eclectic remedy, and highly valued. The oil is too active for internal use unless well mixed with mucilaginous substances. In small quantities of not over a drop on a lump of sugar it works very effectively in cases of hoarseness and other throat troubles. This oil is the principal ingredient in the well-known Eclectic preparation called Compound Stillingia Liniment.

E. Stillingia Liniment.—(Compound Stillingia Liniment.) The name of this preparation is misleading, because the word *liniment* leads one to think only of a preparation for *outward application*. The larger amount of Stillingia Liniment is used *internally*, in which direction we consider it invaluable. Its uses are aptly expressed by Dr. Scudder, as follows:

This old remedy is most efficient for the relief of long-standing and obstinate coughs. For this purpose, we direct from 1 to 2 drops upon a lump of sugar, two or three times daily; and if there is an affection of the larynx, that it be freely applied to the throat; in the first stages of croup, give to a child two years old $\frac{1}{2}$ to 1 drop upon a lump of sugar every hour or two, as necessary. It is also one of the best applications to the throat in croup. SHAKE WELL BEFORE USING.—*Scudder's Materia Medica and Therapeutics.*

PART THIRD.

Retrospective: Throughout the foregoing abridged history will be perceived numerous references to connected subjects that could not be more fully considered, even by notes. For example, many readers might ask who were the "Fashionable Doctors" referred to on page 5, and where were they employed? Physicians (of different schools) in an earnest desire for information, might wish a definition of the term "Eclectic," as applied to that section of physicians practicing medicine in America. Each of these questions would be appropriately pertinent, but yet a discursive or comprehensive presentation of even these subjects would be impossible in the limited space of this treatise. Again, biographical notes concerning such men as Wooster Beach, Samuel Thomson, John King, Cullen, Dunglison, Barton, and others, after the manner of that on pages 5 and 6 concerning Dr. Lettsom, would be helpfully appropriate. But to present these explanatory notes satisfactorily would require more space than the full thirty pages of the treatise. Then, too, a section concerning the theories of Samuel Thomson, and a description of his courses of medication, referred to on page 8, would appeal to some as being essential to the completeness of this historical sketch, but this is thoroughly embodied in Lloyd Library Bulletin No. XI, whilst Lloyd Library Bulletin No. I is wholly devoted to Dr. B. S. Barton. Concerning such references as that on page 7, to the Mediæval European medication fallacies and methods, Cullen's *Materia Medica*, the works

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of Quincy, and the Edinburgh and London Dispensatories, we will remark that these are representative fragments of a great literature, midway between alchemy and modernism. These publications comprise many hundred volumes in the Lloyd Library, all of which are at the command of persons concerned in further consideration of this feature of the history of medicine and medicines. The term "domestic European empiricists," page 7, is employed in connection with the heroic side of semi-barbarous medicine, because those works also embody much that at that date was both orthodox and popular, but which now would be viewed by most persons as both barbarously inhuman and inexcusably illogical. These questionings, and others such as these, will occur to many readers and need be answered by the simple statement that fully as many, and more, have appealed to the author, as the work progressed.

It will be perceived that the problem of the "Concentrations," taken as a whole, is not that of an epoch which stands separate and isolated from other most intricately connected subjects of that period. Upon the contrary, the alkaloids, resins, resinoids, and concentrated principles of that date, dovetailed into a progressive therapeutic and pharmaceutic evolution, still in process. They were intimately connected with a many-phased problem that concerned pharmacy and medicine, in a passing along that is yet progressing.

The paragraph near the bottom of page 17, written and printed in 1875, in a day when such preparations were more essential to commercialism than now, indicates that the author's views, expressed in the present paper, have not been altered from those held in former years, and that no more pronounced expression of them is now possible than was made by him thirty years ago. The reader will perceive that the writer credits the legitimate alkaloids, resins, and such as have been established in pharmacy and in therapy, with a position that should not be confounded with unclassified mixtures. Such alkaloids as atropine, sanguinarine, berberine, cocaine, codeine, scopolamine, morphine, quinine, hyoscamine, eserine, brucine, strychnine, and the few others entitled to useful positions, as well as such resins as those of jalap, podophyllum, and macrotys, stand as useful and creditable evidences of the progress that has been made during and since the day of the disappointments of the earliest resinoid enthusiasts of the Eclectic profession, to whom must be assigned a creditable share of those comprising the list.

In this connection, let it not be forgotten that, notwithstanding the many disappointments experienced in the great work attempted by King and others, the establishing of the worthy members of the group, that finally remain, parallel similar efforts of the chemist, the physician, and the pharmacist in other directions, where over-enthusiasts, dominated by unwarranted hopefulness, become complicated in crusades destined to terminate much like the Eclectic resinoid crusade of the 19th century. Let us, with this thought in mind, repeat a fragment of a note on one of the preceding pages of this treatise: "Possibly each comet that streaks the sky leaves a bit of dust that *somewhere, sometime, becomes useful.*"

A Treatise

ON

GLYCONDA,

GIVING THE HISTORY OF NEUTRALIZING CORDIAL, AND THE EVOLUTION OF GLYCONDA.

The Original Formula of Neutralizing Cordial, (page 3), is from Beach's *American Practice of Medicine*, 1850.

For the History and Evolution of Glyconda, and its Introduction under the Auspices of the New York Specific Medication Club, see page 5.

The Committee consisted of: W. L. Heeve, M. D., *Chairman*, Brooklyn; H. Harris, M. D., New York City; Charles Lloyd, M. D., Brooklyn; C. L. Noack, M. D., New York City.

The Principal Treatise on Glyconda, (pages 7-9), is by John Fearn, M. D., Oakland, California.

The Therapeutic Uses of Glyconda (pages 9-15), are from letters by W. L. Leister, M. D., F. B. Packer, M. D., M. Wilkenloh, M. D., George P. Burtchby, M. D., E. R. Waterhouse, M. D., R. A. Clopton, M. D., H. Humfreville, M. D., W. R. Ruble, M. D., H. G. Roth, M. D., John M. Kinder, M. D., J. C. Andrews, M. D., Jas. R. Phelps, M. D., W. C. Cooper, M. D., A. F. Stephens, M. D., Albert B. Whitney, M. D., C. Edwin Miles, M. D., G. Adolphus, M. D., Marquis E. Daniel, M. D., J. P. Harbert, M. D., Ovid S. Laws, M. D., Jason Tyson, M. D., Ralph M. Morrill, M. D., Wm. P. Best, M. D., Jerome M. Keys, M. D., J. B. Davis, M. D., E. E. Colglazier, M. D., A. Waldo Forbush, M. D., N. A. Herring, M. D., B. K. Wood, M. D., J. S. Niederkorn, M. D., S. G. Meredith, M. D., W. T. Johnson, M. D., C. D. R. Kirk, M. D., N. A. Graves, M. D., Geo. A. Doss, M. D., D. Thos. Long, M. D., Elmore Palmer, M. D., C. R. King, M. D., J. E. G. Waddington, M. D., Benj. L. Simmons, M. D., and W. H. Halbert, M. D.

The Original Label of Glyconda is reproduced on p. 15.

For Fac-simile of Carton and Prices of Glyconda, see p. 16.

The History, Chemistry, and Pharmacy are by John Uri Lloyd.

For List and Descriptions of Drug Treatises, see page 2.

DRUG TREATISE, No. XXV.

Issued by LLOYD BROTHERS, Cincinnati, Ohio.

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Treatises on Drugs and Medicines.

We issue systematically special treatises (historical and therapeutical, 16 to 48 pages each) on invaluable drugs, both new and old, and their therapeutical preparations. These are encyclopedic, and highly valued for their intrinsic worth. They are in great demand by scientific men and physicians, for they give the authentic history, description, constituents, uses, and doses of each drug. The medical uses and qualities and scientific descriptions are written for each treatise by selected authorities. We mail these treatises free, on application, to physicians only. In this connection we call attention to the fact that our preparations are restricted to physicians' use, that we make no remedies for popular use, and that we neither advertise nor supply medicines for the home cure of disease.

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 - Treatise No. IV embraces *Veratrum Viride*.
 - Treatise No. V embraces *Chionanthus Virginica*.
 - Treatise No. VI embraces Asepsin and Asepsin Soap.
 - Treatise No. VII embraces *Collinsonia Canadensis*.
 - Treatise No. VIII embraces *Nux Vomica*.
 - Treatise No. IX embraces *Gelsemium*.
 - Treatise No. X embraces *Belladonna*.
 - Treatise No. XI embraces *Oenanthe Crocata*, Vegetable Caustic and *Crataegus*.
 - Treatise No. XII embraces Ergot.
 - Treatise No. XIII embraces *Macrotys*.
 - Treatise No. XIV embraces *Dioscorea*.
 - Treatise No. XV embraces Development of the Pharmaceutical Still.
 - Treatise No. XVI embraces *Scutellaria* and Poison Antidotes.
 - Treatise No. XVII embraces *Mangifera Indica* and The National Pure Food and Drug Act.
 - Treatise No. XVIII embraces Libradol.
 - Treatise No. XIX embraces Sulphurous Acid, Hydrochloric Acid, Carbolic Acid, Sodium Sulphite, Sodium Phosphate and *Ferri Acetas*.
 - Treatise No. XX embraces *Cupri Acetas*, *Carbo Vegetabilis* and Triturated *Podophyllin*.
 - Treatise No. XXI embraces *Apis*, *Tela Araneæ* and *Cantharides* [in press].
 - Treatise No. XXII embraces Opium, and its Eclectic Substitutes.
 - Treatise No. XXIII embraces *Hydrastis Canadensis*.
 - Treatise No. XXIV embraces Resinoids, Alkaloids, and the so-called Eclectic Concentrations [in press].
 - Treatise No. XXV embraces *Glycyrrhiza* and the History of Neutralizing Cordial.
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LLOYD BROTHERS, Cincinnati, Ohio.

GLYCONDA.

[Trade Mark.]

Concentrated, Sugarless, Neutralizing Cordial.

[Full Drug Strength of the Original Beach's Formula.]

Preliminary.—In the early part of the nineteenth century American practitioners of medicine were much concerned in the treatment of bowel complaints, then, especially during the summer months, very prevalent throughout the country. The usual astringents produced serious after consequences, whilst the general professional treatment was cruel and exhaustive to the patient. It was discovered by the botanic physicians that a combination of rhubarb, peppermint leaves, saleratus and brandy produced a remedy that, kindly in its action, and soothing in its after effects, was yet very effective, and devoid of the objections attached to the then prevalent severe courses in medicine. In botanic and other literature, formulas embracing these substances became popular, but were first made authoritatively conspicuous in Beach's publications. Hence, as the credit is generally assigned to that authority, we introduce a verbatim copy (from *American Practice of Medicine*, Vol. III, Beach, 1850), of the formula announced by Dr. Beach, as follows:

Neutralizing Cordial or Mixture.

Take Turkey Rhubarb, ground, 1 ounce,
Peppermint Leaves, ground, $\frac{1}{2}$ ounce,
Sal-æ-ratus, ground, 1 ounce.

Mix. Put the materials in a stone jar, and add one pint of boiling water; let it stand till cold, and then add half a pint of best brandy and half a pound of loaf-sugar. Digest for a day or two, and strain through flannel.

Use. This is an invaluable remedy in cholera-morbus, dysentery and diarrhœa. It is administered in every stage of these diseases with the best effects. It is antacid, anti-dysenteric, and I may say, anti-*choleraic*. This preparation has now become so generally known as scarcely to require further remark here. Nothing that I have ever seen can compare with it in cholera, dysentery, and other diseases of the bowels.

It was subsequently discovered that bicarbonate of potassium in a purified condition was superior to commercial saleratus,* and also that *hydrastis canadensis* as a part of the formula became an invaluable

* Saleratus is impure potassium bicarbonate. It was once very popular in America, being used in bread-making. When sodium bicarbonate was first introduced it was under the name *soda saleratus*. Most bitterly was it opposed by users of "potash saleratus." Even as late as 1880 we have known parties who used only the old style saleratus.

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able therapeutic aid. In addition, the stimulating action of peppermint oil, and the astringency of cinnamon, were found desirable in the making of a superior preparation, and in 1854, Dr. Hill, of Cincinnati, who was then an extensive dealer in botanical pharmaceutical preparations, gave a formula to Professor John King, embodying rhubarb, hydrastis, cinnamon, refined sugar, oil of peppermint, potassium carbonate and brandy, the formula for working same being found in Vol. II of the American Dispensatory of the present day. As a note Dr. King added, "The whole of the active properties of the ingredients may be obtained with more certainty by using alcohol (76 per cent) instead of brandy, owing to the great want of uniformity in the quality of the latter."

This preparation, modified by expertness of manipulation and thoroughness of maceration and percolation as practiced by different individuals, stood as a standard for Neutralizing Cordials from 1854 until 1908. It was introduced into Pharmacy in the United States under the name "*Syrupus Rhei et Potassii Compositus*," or Compound Syrup of Rhubarb and Potassium, and the formula, based upon the foregoing, made from fluid extracts of the drugs, appears to-day in the National Formulary.

However, the original term, Neutralizing Cordial, maintains its supremacy in pharmacy and in the language of most of the physicians who employ the remedy. That term not only has historical precedence, but is therapeutically explanatory of the antacid action of the remedy. Indeed, it has long been called by some physicians Alkaline Cordial, which indicates that it has the power of neutralizing an acid, a quality due to the alkaline ingredient, whether it be Beach's saleratus, Hill's carbonate of potassium, or Locke's potassium bicarbonate.

Neutralizing Cordial under its present formula became established as a thing in itself, perhaps more broadly and firmly than any other compound that has stood for nearly one hundred years, with steadily increasing favor. It is one of the most valuable, useful, and kindly remedies, perhaps having a reputation superior to any other mixture or compound used in the direction of its application in therapy, and is to-day made in immense amounts.

It had, however, one objection for which its originators can not be criticised, because of the fact that when Neutralizing Cordial was devised sugar was the only pleasant sweetener known, and hence was, naturally and rationally, the agent employed to overcome the disagreeable taste of rhubarb, and to modify the sharpness of the peppermint and cinnamon. However, the necessity for the use of sugar in the preparation no longer exists, for the recently devised

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pharmaceutical compound Glyconda carries all the qualities of the perfected Neutralizing Cordial, without any of the objections that arise when compounds containing sugar are administered in complaints of the bowels involving fermentative conditions or diabetic affections. The description and history of Glyconda may be briefly stated as follows:

History of Glyconda.—In 1906, the *New York Specific Medication Club*, being desirous of improving the old form of Neutralizing Cordial without disturbing its medicinal qualities, appointed a committee of its members to investigate and report on this subject. The committee was constituted as follows:

W. L. Heeve, M. D., *Chairman*, Brooklyn.

H. Harris, M. D., New York City.

Charles Lloyd, M. D., Brooklyn.

C. L. Noack, M. D., New York City.

Numerous investigations were made, the preparation being prepared in large and in small quantities, by means of different menstrua, alcoholic, non-alcoholic, with and without glycerin. It was found that the dose and keeping qualities of the Sugarless Neutralizing Cordial of the first attempts to make a sugarless preparation did not parallel the old form of Neutralizing Cordial. However, after the series of experiments was completed, and after many specimens, some of them in large amounts, had been distributed among physicians qualified to comprehend the subject in a clinical way, it was decided that the formula adopted under the term "*Glyconda*" carried all the qualities of the original Neutralizing Cordial, and was devoid of the objectionable features present in the Neutralizing Cordial of the olden time. The subject may be summed up as follows:

"The New York Specific Medication Club some time ago appointed a committee with the object of eliminating the sugar from the old Eclectic remedy, Neutralizing Cordial. Dr. Schaeffer read a most interesting paper on the subject, which was followed by an exhaustive discussion, and the one objection which was raised to the preparation was the amount of sugar it contained. All agreed that if the sugar could be eliminated and its other properties preserved, it would be a perfect preparation. After much correspondence and experimentation, the committee, through its chairman, Dr. W. L. Heeve, appealed to Lloyd Brothers, and as a result they present us to-day with Glyconda, a concentrated neutralizing mixture with the sugar eliminated."—*The Eclectic Review*, New York, Geo. W. Boskowitz, M. D., Editor.

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To this it may be added that an experience of nearly two years in the general distribution of the remedy, and its general use, the country over, indicate that nothing further is desired, and that the remedy is now pharmaceutically and therapeutically perfect.

Description.—Glyconda is very pleasant to the taste, can be given in large doses without ill effects, and carries the full therapeutic value of the well known Neutralizing Cordial. It has the following qualities :

1st. Each minim of Glyconda carries the total drug constituents of a like amount of Beach's Concentrated Neutralizing Cordial.

2d. It is effective in less than the dose of the old form Beach's Cordial, because no ill effect or after complication of sugar has to be overcome.

3d. To most persons it is grateful, by reason of its pleasant flavor and warming qualities.

4th. It does not nauseate.

5th. It will neither ferment nor freeze.

6th. It carries no added sugar, and produces no saccharine fermentation in the stomach or bowels.

Uses.—In one direction particularly Glyconda should be employed where Neutralizing Cordial is prohibited, this being in diabetes or in other diseases where sugar is inadmissible. Absence of sugar prevents saccharine fermentation, and Glyconda is therefore superior to Neutralizing Cordial as a remedy for all derangements of the stomach and bowels where the bowels are loose, such as cholera morbus, diarrhea and dysentery, and especially for cholera infantum and summer complaint of children. Glyconda is also a valuable tonic or stomachic, and a pleasant antacid in "sour stomach." It promptly relieves headache and similar complications due to acid stomach.

Dose.—For an adult, from one to two teaspoonfuls, in water if desirable, at intervals of half an hour or two hours, increasing or diminishing the dose according to the violence of the symptoms. For children, one-fourth the quantity.

No better method of authoritatively establishing the use of a remedy in disease can be suggested for information of inquirers than by citations from the reports of practicing physicians who employ the remedy in disease expressions. Especially is this true when such physicians are thoroughly conversant with the use of other remedies that have been employed by them in the same direction. We therefore introduce reports from practicing physicians who have experi-

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ence with remedies in general, and especially with Neutralizing Cordial, reproducing first from the Eclectic Review abstracts from a paper by Dr. John Fearn, of Oakland, California, then following with a succession of terse reports by practicing physicians in widely separated portions of America.

Glyconda, an Improved Neutralizing Cordial.

BY JOHN FEARN, M. D., Oakland, California.

Few who read these lines have had a longer experience with that old combination, Neutralizing Cordial, than the present writer. Nearly forty years ago I made my first batch of Neutralizing Cordial, and was very proud of it! As the years rolled by I made changes in the formula that others as well as myself thought were improvements. After I settled on the Pacific slope other neighborhood doctors began to test it and call for it, until finally there was a considerable demand for it. Those who used it pronounced it very good, and as they moved to other States they still sent long distances for it. But through all these years its usefulness was marred by two serious objections. The dose was too large for a sensitive stomach, and the sugar in it was unfortunate. This was a very serious matter, as the preparation would occasionally set up saccharine fermentation, just the very thing we were often aiming to counteract. This condition Glyconda overcomes.

Glyconda is not an unpleasant remedy to take. We all know by experience the unpleasantness of sweets to many sick persons. With Glyconda this trouble is almost entirely overcome, and we can give it, in doses small or large, to infants and adults, as a panacea for vomiting, as well as for acidity and foulness of the stomach. Glyconda is one of the best carminatives the physician has at his command. Take, for instance, flatulent dyspepsia. In many of these cases, an hour or two after eating, the patient becomes the victim of the most distressing stomach sensations. Many times it is not an acute pain, but a sense of weight and oppression almost unbearable. In such a case, give to an adult from one to two teaspoonfuls of Glyconda; the relief is almost immediate. The alkali counteracts the acidity and burning, and the kindly, soothing and stimulating influence of the mentha piperita puts a quietus on the local oppression, pleasing to the doctor and grateful to the patient. The dose can be repeated as often as needed, without fear. In a very severe case of measles, with high temperature and sick stomach, a few drops were given with every dose of the special sedative, the results being all that could be desired. In bilious colic, add $\mathfrak{z}$ i to $\mathfrak{z}$ iii Sp. Med. dioscorea to $\mathfrak{z}$ iv Glyconda, and give teaspoonful doses every one to three hours.

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For any case of pain in the bowels this is a grand combination, and with Glyconda there is no fear of overdosing.

In the nervous dyspepsia of delicate women, use

℞ Sp. Med. Ignatia, ... ℥ ss,
Glyconda, ... ℥ iv.

M. Sig. ℥ i, four times a day.

If there is a call for it, Sp. Med. Pulsatilla can be added.

If there is irritation of nerve centers, where the patient is nervous and sleepless, where we need remedies to improve sympathetic innervation, where circulation and nutrition must be improved, one of the best combinations is

℞ Sp. Med. Passiflora incarnata, . . ℥ i to ℥ ii,
Aqua mentha piperita,
Glyconda, ... aa, ℥ ii.

M. Sig. A teaspoonful every two or three hours.

A very unpleasant class of cases comes to the doctor at times, where specific urethritis has been treated with large doses of balsam copaiba. The stomach is disturbed, there is complete loss of appetite, and the patient is in a wretched condition. In such cases drop out the copaiba, and, using Glyconda as a base, add the special sedative as indicated, or Sp. Med. Macrotys, Sp. Med. Cannabis indica, Sp. Med. Rhus, or Sp. Med. Mellifica, wherever one of these is indicated. You will be delighted with the results.

Let me call attention to one other class of patients; those unfortunates who have had, and are still suffering with syphilis. In their past they may have been vicious, or perhaps they have only been unfortunate; but if we are worthy the name of physicians, we will try to help them. How wretched is the condition of such a patient! He has no appetite, and very little power to digest food. He is losing flesh, sleeps but little, suffers much pain, hope is gone, and, often, money as well. In such cases give

℞ Sp. Med. Corydalis formosa, ... ℥ i,
Glyconda, ... ℥ iii.

M. Sig. ℥ i, four times a day.

After taking this, give the following :

℞ Sp. Med. Berberis aquifolium, ... ℥ i,
Glyconda, ... ℥ iii.

M. Sig. ℥ i, four times a day.

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Attend to cleanliness and general health conditions. Continue treatment on these lines, and your patient will soon be a new man.

But the combinations that can be used with Glyconda as a base are almost endless. It is a grand remedy, and a great improvement on the old Neutralizing Cordial.

From Other Physicians.

"Glyconda is the name bestowed upon the latest manipulation of the Neutralizing Cordial of Beach. It is sugarless and almost spiritless. The writer has been an advocate of Beach's Neutralizing Cordial for many years. In almost all derangements of the stomach and bowels of atonic character, either with children or grown persons, the Neutralizing Cordial was applicable. In cases of acid conditions in the digestive organs of children or, indeed, any acid case, the essayist made use of it. A too light in color discharge was regarded as indication of partial arrestment of flow of bile. The cordial would excite the biliary center, when the needed saponin solvent would appear. It mattered not if dejections were frequent, a full dose or two of the cordial usually would precede any other treatment. In common diarrheas of the character pointed out, the cordial was admissible, unless, as was the case occasionally, there was such overchargement of acid products that the sugar augmented the fermentation. The other alkaline means then took precedence, or the cordial was withheld entirely.

"In Glyconda the above referred to possible objection is wholly removed. The potassa and rhubarb are represented, as also are the stimulant aromatics, but *the sugar is absent*. Another all-the-time present advantage is, that it requires about one-half the amount to produce the same gland and alvine response. The palatableness of the original Beach's is fully retained in Glyconda without the sugar, which points plainly to the advancement of the art and science of pharmacy. On complaining to the house of Lloyd Brothers that Glyconda was much more active than the original Neutralizing Cordial, and that I had purged unduly some children with the usual dosage, the senior member of the firm,—Professor John Uri Lloyd, caused a formula of two-thirds the standard strength to be sent me, and for children I find this more satisfactory.* As the profession learns the advantage of Glyconda over the old-fashioned and sugared product—Neutralizing Cordial, all progressive practitioners will adopt the use of the former. Glyconda is one of the certitudes in medicine, and will remain after all the medical nihilists have passed on. In conclusion it is fair to say that Neutralizing Cordial is an Eclectic preparation, devised by Dr. Wooster Beach,—one of the very earliest Eclectic physicians and authors."—W. L. LEISTER, M. D., Oakland City, Ind.

"My experience with Glyconda has been entirely satisfactory. My first 8 ounce bottle I used in a case of summer complaint, in a child sixteen months old, that had had from six to fifteen passages daily for several weeks. Neutralizing Cordial and astringents would check, but not cure the diarrhea, nor prevent the fermentation wholly. I gave the Glyconda and *no other medicine*. In three days fermentation ceased, and in five diarrhea stopped. I continued Glyconda in half teaspoonful doses till eight ounces were taken, and the child has gained eleven pounds."—E. B. PACKER, M. D., Osage City, Kansas.

* The dose on the label of Glyconda is now such as to give the full effects of the remedy as regards its increased activity over the less energetic cordials sold under the name Neutralizing Cordial.

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"I find Glyconda a tonic to the sympathetic and pneumogastric nerves. Have used it in cases of pregnancy, in an anemic patient with nausea and vomiting, with loss of appetite. The derangements of the digestive organs soon became the normal, and the urine was left free from sugar and albumin."—M. WILKENLOH, M. D., Chicago, Ill.

"While a student in the old Eclectic Medical Institute in Cincinnati, Professor F. J. Locke, whom every student loved and respected, gave the class his formula for Neutralizing Cordial, which was much like that of Beach's. For a number of years I used large quantities of the cordial after Locke's formula, and felt that I could not get along well without it. Lately I have been prescribing Lloyd's Glyconda, which I prefer to the old style cordials for two reasons. It contains no sugar, and the dose is much smaller. The new preparation has come to stay, and Lloyd Brothers deserve the gratitude of every physician who has been a friend of the old Cordial, in giving us a combination of its valuable and trustworthy agents, without the sugar, which was its only drawback, and yet a very serious one."—GEORGE P. BURTCHEY, M. D., Oskaloosa, Iowa.

"I have used Neutralizing Cordial for twenty-five years, but find Glyconda better than the old time preparation, because in cases demanding its use, syrups or sugar are contra-indicated on account of promoting gastric fermentation which we are fighting. I have used Glyconda in several cases of teething diarrhea from fermentation, and like it very much."—E. R. WATERHOUSE, M. D., St. Louis, Mo.

"My experience with Glyconda has been most gratifying. The absence of sugar, and the smaller dose, will commend it to all. I recently used it in a bad case of cholera infantum with vomiting and green stools, and had immediate curative results."—R. A. CLOPTON, M. D., Milan, Tenn.

"Glyconda is better in every respect than the Neutralizing Cordial. My patients like it, and my experience with it has been the very best."—H. HUMFREVILLE, M. D., Waterville, Kans.

"I have used Neutralizing Cordial for twenty years, and find Glyconda equal, if not superior to it. The flavor of Glyconda is exceptionally palatable, and my experience with it has been in every way favorable. In some bad cases of bowel derangements incident to the teething period, the results were all that could be desired. It is certainly an ideal preparation, either alone, or in conjunction with bismuth subnitrate, or other adjuncts."—W. R. RUBLE, M. D., Smith's Grove, Ky.

"I think Glyconda a very superior preparation, on account of the absence of sugar. Have used it in cases of diarrhea and vomiting, with very satisfactory results. One teaspoonful every two hours, checks either, and restores normal digestion."—H. G. ROTH, M. D., Mobeetie, Texas.

"Glyconda is perfect, in color, taste and effect. I have been treating a child two years old, suffering from dysentery of two weeks' standing when I took the case. Put the child on Glyconda, with a decided improvement in one day, and in two days the child was out of all danger, and made a hasty recovery. I expect to use Glyconda from now on, and can heartily commend it to all physicians."—JOHN M. KINDER, M. D., Lookaba, Okla.

"Glyconda is much superior to the well known Neutralizing Cordial, and its results are all that can be desired by the most exacting, allaying irritation and overcoming acidity of the stomach. I predict a large demand for Glyconda, in

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those affections among our little patients during the heated terms, it being more pleasant to the taste, and more effective, than the Neutralizing Cordial."—J. C. ANDREWS, M. D., Los Olivos, Calif.

It is some sixty years ago that I first became acquainted with a remedy for bowel troubles, which an old botanic practitioner used to employ with splendid results. It was known as "Neutralizing Powder," a compound of powdered rhubarb, potassium bicarbonate, and peppermint leaves. The old man used to put a teaspoonful or two in a coffee cup, fill the cup with boiling water, and when cool administer a teaspoonful at intervals of an hour. It was a sovereign remedy for the form of cholera resulting from overfeeding, or a gorge on green apples.

Another form of this remedy was made from rhubarb, cinnamon, and golden seal, with the addition of oil of peppermint, and of potassium bicarbonate.

For years when engaged in the desultory practice of medicine in connection with another profession, I used to consider this my sheet anchor in bowel disorders, but later on I began to find this remedy less effective and practically abandoned it. Whether the uncertainty of the herbs, especially the golden seal, or adulteration of ingredients were prime factors in the problem, I will not pretend to say. Probably all these things contributed to make the compound powder a failure, while the sugar, which was used in the compounding of the "Neutralizing Cordial," certainly had a more or less deleterious effect on the stomach, generating an acid that more than counter-balanced the effect of the potassium.

Any way, I got in the way of neglecting the old compound, and used some of the various preparations so plentiful in the market.

The first of the present summer I received a bottle of a new preparation from Lloyd Brothers, of Cincinnati, bearing the name of Glyconda, and claiming to be an improved form of "Beach's Neutralizing Cordial." The confidence I feel in all the preparations of this house was a sufficient incentive to me to try the mixture, knowing that the ingredients were certain to be pure, fresh, and just what they purported to be, and the way that compound settled the cases of cholera that have come into my hands has delighted me, and it seems a duty to call the attention of my professional brethren to it. One case that was closely verging on to what we old fellows used to call "bloody flux," yielded to this compound in twenty-four hours. This was a case of a man forty years old. In several cases of bowel disorders caused by eating green fruit, the cure has been only a question of a very few hours.

The small amount of alcohol, only 11 per cent, makes this preparation a vast improvement over the old cordial, which I used to heat in order to evaporate the alcohol. The small amount of alcohol in Glyconda can be easily and quickly eliminated in a few minutes by heating it, although the quantity—about 6 drops to the dram—is of little consequence.

I am not writing this in the interest of the house whose product it is, but simply to call the attention of the profession to what I have proved to my satisfaction, a most valuable addition to the contents of the physicians' satchel. A small bottle of it will often save valuable time in an emergency.—JAS. R. PHELPS, M. D., Dorchester, Mass.—*Medical Summary.*

"I have had an opportunity to use Glyconda three times, and it worked charmingly in each case. I confidently predict for it a brilliant future. It satisfies the esthetic demands of pharmaceutic elegance—as all your preparations do—it is most agreeable to the taste, and it is an ideal carminative. In my judgment

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its innocence of sugar multiplies its efficacy greatly. This feature eliminates the possibility of saccharine fermentation, an inestimable gain."—W. C. COOPER, M. D., Cleves, Ohio.

"From the looks and taste of Glyconda, I believe you have perfected, as nearly as may be done, that old Eclectic stand-by, 'Neutralizing Cordial.' I am sure it will be much better than the old sugary mixture."—A. F. STEPHENS, M. D., St. Louis, Mo.

"I have used Beach's Neutralizing Cordial for more than forty years, as did my father, Dr. Elijah Whitney, before my time. My experience with Glyconda is the same as with the Neutralizing Cordial. I have used it in cramps of the stomach and bowels, diarrhea of children, marasmus in infants, derangements of digestive organs in teething, and in all acid and fermentative derangements of the chylipoietic viscera, so prevalent in the summer."—ALBERT B. WHITNEY, M. D., New York, N. Y.

"To-day I have had my first opportunity of dispensing the Glyconda. The taste is pleasanter than Beach's Neutralizing Cordial, and it is an elegant preparation."—C. EDWIN MILES, M. D., Boston Highlands, Mass.

"Glyconda is marvelous in its results, far superior to the preparations I have been using. I had been treating a child 16 months old for a week with not very much improvement. Put it on Glyconda, and immediate results were noticed, and in two days the child was entirely well."—G. ADOLPHUS, M. D., Atlanta, Ga.

"I have used the old Neutralizing Cordial all my professional life—twenty years—and would feel lost in the practice without it, or Glyconda, which I now use instead. I like Glyconda better, as the flavor is better, patients as a whole like it better, and its effect is better in all conditions where the old Neutralizing Cordial was indicated.

"In hot malarial sections of the country such as this, a preparation such as Glyconda has a wide field of usefulness, and I use it nearly every day. In addition to the usual intestinal conditions indicating this remedy, I employ it as a vehicle in the administration of such remedies as are indicated in the convalescence of all forms of wasting fevers and malarial cachexia, remedies such as *Euonymus*, *Chelidonium*, *Nux Vomica*, *Fowler's Solution*, *Berberis Aq.*, *Gentian*, etc., I get quicker results, better assimilation, and at the same time enjoy the consolation that my patient, in addition to getting the indicated tonic, is also getting in Glyconda a most excellent stomachic, and a preparation that will establish and maintain stomachic and intestinal asepsis better than any other preparation of which I have knowledge."—MARQUIS E. DANIEL, M. D., Honey Grove, Tex.

"For the past three years I have practically abandoned the use of Neutralizing Cordial, on account of the sugar it contains; the fermentation which it produced seemed more prone to occur in the summer season, the time of year when I most desired to use the remedy. Glyconda comes to fill a long felt want, and is, in my opinion, the most valuable addition that has yet been made to our summer remedies. I have used it in a variety of cases peculiar to the summer season, and have been pleased in every instance."—J. P. HARBERT, M. D., Bellefontaine, Ohio.

"I have used Glyconda in one case, that of a three year old child that had been vomiting through the night, showing much acidity. A few ten-drop doses in a little water, half hourly, corrected the condition completely."—OVID S. LAWS, M. D., Los Angeles, Cal.

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"I used Glyconda in combination with *Mangifera Indica*, for a baby with entero-colitis, with best results. Those who saw patient thought the case almost hopeless."—JASON TYSON, M. D., Santa Anna, Tex.

"The old Neutralizing Cordial has always been a favorite with me, especially in cases of infantile disorders. I used the cordial, however, with something of a handicap. First, I always heated it to eliminate the alcohol, which I never use in intestinal diseases if I can avoid it. But there was the sugar, which could not be eliminated, and I got into the habit of using the powdered herbs and making a tea, using glycerine as a sweetening. But this took some time to cool, after adding the boiling water, and I never leave a patient until I see that the remedy is working, and working my way. The uncertainty of strength in the herbs was also an annoying factor; also the possibility of their being worthless, from age. I am glad, as every therapist must be, that you have brought your skill to bear in perfecting this most valuable cordial, and it will give me great pleasure if I can help to draw attention to it among practitioners who are not afraid to allow themselves to think, and investigate.

"I used to use Neutralizing Cordial, but got out of conceit with it. Glyconda is much pleasanter in flavor, and therapeutically it leaves nothing more to be desired. Have used it in several cases, mostly children, with most satisfactory results. One of my cases was too near typhoid-dysentery for my comfort." (See also page 11.)—JAMES R. PHELPS, M. D., Dorchester, Mass.

"Glyconda is a decided improvement on Neutralizing Cordial. It is the best combination, for the purpose intended, that I have ever used. I have used it in many cases of summer diarrhea, acute and sub-acute, and milk infections in infants and children. It stops vomiting, corrects the green stool, and is the only medication necessary subsequent to a cleaning out with castor oil. Geranium adds to its astringency."—RALPH M. MORRILL, M. D., Lincoln, Neb.

"I am impressed with Glyconda, and consider it an elegant preparation. Have used it in cases of summer diarrhea (acute dyspeptic diarrhea), acute diarrhea with cramping and tormina while at stool, and acute indigestion from eating of unripe fruit. Relief was prompt and recovery followed."—WM. P. BEST, M. D., Indianapolis, Ind.

"Glyconda is an old friend in a new dress, and I shall be glad to try it when an opportunity offers. I believe that the absence of sugar, and the lessened dose, will commend it to all."—JEROME M. KEYS, M. D., Omaha, Neb.

"My experience with Glyconda has been eminently satisfactory. It appeals to me for three reasons: 1st. The small dose. 2d. The pleasant taste. 3d. The elimination of sugar.

"I might add a fourth reason: It gets the results, and that, too, without deleterious or objectionable results.

"In one case in particular, of cholera infantum, given up to die, Glyconda was of great service in saving the baby, greatly to the satisfaction of myself and the patient's friends."—J. B. DAVIS, M. D., Pontiac, Ill.

"I recently used Glyconda in three cases of teething children with bowel complications, and an old lady, 78 years of age, who had an attack of gastritis. In the administration to the children, perfect digestion of milk took place almost immediately, and the old lady noticed a decided improvement after three or four doses, there being no noticeable derangement in the stomach after 36 hours' use of Glyconda."—E. E. COLGLAZIER, M. D., Rush Center, Kas.

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"I am pleased, as every up-to-date therapist must be, with Glyconda, the perfected form for Neutralizing Cordial, a remedy that I have used from childhood. Glyconda is an ideal carminative, far above the ordinary pharmaceutical articles made on Neutralizing Cordial lines. In results, it leaves nothing to be desired."—A. WALDO FORBUSH, M. D., Somerville, Mass.

"Glyconda is certainly a great improvement on the old 'black strap' mixtures so generally found on the market. I have found its results perfectly satisfactory, and my little patients are highly pleased with its taste."—N. A. HERRING, M. D., Benton Harbor, Mich.

"I have prescribed Glyconda in several cases of diarrhea in children with marked success. I find it perfectly satisfactory because of its pleasant taste and effectiveness. Fine for babies' colic or diarrhea."—B. K. WOOD, M. D., Anadarko, Okla.

"Glyconda is pleasant and satisfactory. Use it in cases presenting the same indications as for Neutralizing Cordial, but the dose need not be so large."—J. S. NIEDERKORN, M. D., Versailles, O.

"I have recently prescribed Glyconda in eleven cases, ages ranging from four months to fifty years, and I am more than well pleased with the results. I had become thoroughly disgusted with the cordials I had before used, as I had come to the conclusion that in their use I had continually produced intestinal fermentation, thus inducing the exact condition I was trying to overcome."—S. G. MERRITH, M. D., Cowgill, Mo.

"Have used Glyconda in summer diarrhea, with green stools, in children, with satisfactory results in every case; in entero-colitis in some old people, with similarly good results; in stomatitis with ulceration in children, results prompt and sure; and in gastro-intestinal indigestion, with fermentation, with good results."—W. T. JOHNSON, M. D., Pawnee City, Neb.

"I find Glyconda altogether superior to Neutralizing Cordial. All cases of derangements of the bowels associated with a white or any shade of gray coating of the tongue, are benefited by giving Glyconda. It is pleasant to every one, and will be retained in nearly all cases."—C. D. R. KIRK, M. D., Shuqualak, Miss.

"I like Glyconda better than the old Neutralizing Cordial, which I have used for many years. I have used it with good results in ten cases, mostly babies with bowel trouble. They take it well, and it is prompt and efficient in action."—N. A. GRAVES, M. D., Chicago, Ill.

"I have always been a great user of Neutralizing Cordial, but from the experience I have had with Glyconda, feel sure that it will soon take the place. Have used it with several small children, where the results were all that I could ask."—GEO. A. DOSS, M. D., Atlanta, Ga.

"Have used Neutralizing Cordial for twenty years, never being without it. Have substituted Glyconda in a number of cases, varying in age from two to eighty years, with results satisfactory in every respect."—D. THOS. LONG, M. D., Topeka, Kas.

"Your Glyconda, ordered for me last Saturday by telegraph, came into my office Monday A. M., and saved the life of a fifteen month boy."—ELMER PALMER, M. D., Buffalo, N. Y.

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"Relief and cure follow its use. It is a pleasure to prescribe it. In every case in which I have used it among children I have had best results."—C. R. KING, M. D., Atlanta, Ga.

"Glyconda is as much above Neutralizing Cordial, as the Specific Medicines are above the ordinary Pharmaceutical Fluids."—J. E. G. WADDINGTON, M. D., Detroit, Mich.

"Glyconda is an improvement on the old Neutralizing Cordial."—BENJ. L. SIMMONS, M. D., Granville, Tenn.

"Glyconda is far better for the stomach than the old Neutralizing Cordial mixture with sugar."—W. H. HALBERT, M. D., Nashville, Tenn.

Facsimile of Glyconda Label.

[For facsimile of Carton, and for prices, see page 16.]

The amount of alcohol is assayed for each batch.

GLYCONDA

TRADE MARK

CONCENTRATED

SUGARLESS NEUTRALIZING CORDIAL.

Full strength of the original Beach's Cordial.

LLOYD BROTHERS, - Cincinnati, O.

Prepared at the suggestion of WM. L. HEEVE, M. D.

This is a fluid form of Beach's Neutralizing Cordial, prepared of such a strength and in such a manner that it is more efficacious than Beach's original liquid. Physicians will find this a valuable remedy for all derangements of the stomach and bowels where the bowels are loose, such as cholera morbus, diarrhea and dysentery, and especially for cholera infantum, and summer complaint of children. Absence of sugar prevents saccharine fermentation. Glyconda is also a valuable tonic or stomachic.

DOSE.—For an adult, from one to two teaspoonfulls at intervals of half an hour or two hours, increasing or diminishing the dose according to the violence of the symptoms. For children, one-fourth the quantity.

ONE

HALF

POUND

GLYCONDA.

**LLOYD BROTHERS,
CINCINNATI, OHIO.**

The above (excepting alcoholic content, which varies in order to make the drug strength uniform) is a facsimile of the Glyconda package.

Prices of Glyconda.

$\frac{1}{2}$ lb. in carton, ... \$0 35 each
1 lb. in carton, ... 65 "
2 lb. in bottle (not carton), 1 20 "

$\frac{1}{2}$ gal., bottle (not carton), \$2 20 each
5 pt. bottle (not carton), . 2 75 "
1 gal. (and over) jug, . . 4 00 per gal.

LLOYD BROTHERS, - - - - - **CA**

200

A TREATISE ON DIGITALIS

Giving Its History, Chemistry, Pharmaceutical Preparations and Therapeutic Uses.

Chemistry of Digitalis, by Professor Dr. H. KILIANI, Freiburg, Germany.

Toxic Digitalis Preparations, by H. W. FELTER, M. D.

Official Preparations of Digitalis and their Poisonous Action, by GEORGE F. BUTLER, M. D.

Therapeutic Action of Specific Medicine Digitalis, with Reports from Physicians (second cover page).

Uses of Digitalis, by A. F. STEPHENS, M. D.

Digitalis, Indications and Contra-Indications, by GEORGE W. BOSKOWITZ, M. D.

Uses of Digitalis, by FINLEY ELLINGWOOD, M. D.

History and Pharmacy of Digitalis, by JOHN URI LLOYD.

Pen Drawing of Digitalis Leaf, by Miss EDA VAN GUELPEN.

Drug Treatise Number XXVI.

This Treatise was mainly in type in 1909, but has been held from distribution awaiting certain physiological reports not yet completed.

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DIGITALIS. FOXGLOVE.

COMMON NAME: Foxglove, Purple Foxglove.¹

Digitalis frequents silicious lands, but does not thrive in limestone soil. It is native to, but unequally distributed, over such localities as the Madeira Islands, Portugal, Spain, France, Germany, and especially England. It is

widely cultivated, not only for its medicinal properties, but also as a garden flower, being well known under the common term **Foxglove**, a name ascribed to it both from its resemblance to an ancient musical instrument known as **Foxes Glen**, and from its fancied resemblance to a gloved finger. **Tragus** (see page 11) was "the first systematic author who noticed it, and from him it received its name, **Digitalis** (from **digitus**, finger), in allusion to the German name **Fingerhut**, signifying a finger-stall, the blossoms resembling the finger of a glove."—*Withering*. (See blossom, Fig. 1.) The home of the most prized *Digitalis* is England.

Digitalis is easily grown in lands and countries fitted to its culture, reproducing from self-sown seed. **Motherby** (1775) states that "it grows only in gravelly beds," a statement that has been carried through subsequent literature, but is not fact, although we accept that the plant "prefers" such soil. In limestone lands *Digitalis* failed, under our personal observation, to respond satisfactorily to cultivation. Limestone sections of Kentucky, although very fertile otherwise, and producing luxuriant crops of corn and heavy tobacco, failed utterly with *Digitalis*, although an abundance of seed of unquestioned fertility was employed. In gardens, however, in limestone sections of both Kentucky and Ohio, the transplanted plants thrive for two seasons, but the seeds therefrom fail to maintain the crop. (Fig. 2.) In New York State, in the valley of the Honeoye River, *Digitalis* planted in 1820 in a flower garden on the homestead of the Webster family (the home of the writer's mother) at the present date (1912) continues as a great wild bed, self-sown from year to year.² In some parts of the State of Oregon, *Digitalis* escaped from cultivation, has become a thick roadside plant, growing near Cloverdale luxuriantly and in such abundance as to have led to its consideration as a



Fig. 1. Flower and seed of *Digitalis*.
(Much reduced.)

¹ The term *Digitalis purpurea* is not precise. The earliest references cite that its flowers range from white to purple, and it is a matter of regret that the name is not characteristic.

² Professor M. I. Wilbert, of Washington, D. C., informs us that under favorable circumstances *Digitalis* may become a perennial. Possibly this is a factor in its luxuriant growth in the localities mentioned.

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commercial crop. To Dr. Walter F. Brown, of that city, we are indebted for nice specimens of the leaf, and photographs showing the flower-spikes over nine feet high.¹ He writes as follows:

Replying to your questions I will say:

1. As near as I can find, *Digitalis* has been growing here for twenty years. It was confined to a few spots for several years, but it is now found all over the southern half of this county.

2. It is supposed to have been brought here by pioneers, and cultivated for its flowers.

3. The dairymen claim that some cows will eat it in early spring, when the leaves are tender and other forage is scarce. It has no noticeable effect on the animals that eat it, but they eat very little of it.



Fig. 2. *Digitalis* bed in the author's garden, Cincinnati, Ohio. (Much reduced.)

4. I have used the infusion and the tincture for about fifteen years, and of late years I have used digitalin to some extent.

5. People in this locality make no use of the plant, but look upon it as a despicable weed that takes their hillside pastures.

¹ We regret much that these photographs were too faint for half-tone reproduction.

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Other than the high price of labor in this country, there is no reason why *Digitalis* should not be American cultivated, and produce in abundance sufficient to supply all our needs, from localities such as Oregon, suited to its growth.

Part Used. The leaf of the second year's growth is generally directed



Fig. 3. Prime *Digitalis*, second year, in flower and seed. (Much reduced.)

by "authority" to be used, but in our opinion this limitation to the second year's crop is ill-advised and unnecessary. The mature leaves of either the first or the second year's crop (Fig. 3.) are superior to immature or over-ripe leaves of any year. The standard of excellence should be the fully-matured, air-dried leaf, regardless of the age of the plant, and we question if collectors anywhere discriminate concerning the age of the plant. In this connection we would state that, originally, both the root and the leaf of *Digitalis* were employed in medicine. The root, however, is exceedingly variable in structure, that of the first year's growth being insignificant and sappy, whilst the root of the second year's growth is larger and heavier, and more pronounced in quality. Inasmuch as the leaf possesses fully the qualities of the drug, and is more easily collected, it naturally displaced the root in medicine. Thus the preference once given to the second year's growth of the root created both the confusion and the prejudice whereby the leaf of the first year

was finally ostracised, even in authoritative literature. Thus both Pharmacopœias and standard works on materia medica were illogically led to exclude much excellent *Digitalis* material. In searching for data in this direction, we find that Withering, in 1785, writes as follows:¹

My truly valuable and respectable friend, Dr. Ash, informed me that Dr. Cawley, then principal of Brazen Nose College, Oxford, had been cured of a *Hydrops Pectoris* by an empirical exhibition of the root of the Foxglove, after some of the first physicians of the age had declared they could do no more for him. I was now determined to pursue my former ideas more

¹ From "*An Account of the Foxglove*," by William Withering, M.D., Physician to the General Hospital at Birmingham, London, 1785.

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vigorously than before, but was too well aware of the uncertainty which must attend on the exhibition of the root of a biennial plant, and therefore continued to use the leaves.

In connection with the leaf-selection, Withering is also explicit in distinguishing between the qualities of the leaves gathered at different seasons of the year, but he does not limit the drug to the second year's growth. He states that at different seasons of the year

the quality varies greatly, which, we will remark, is true of all herbs. He therefore suggests that the leaves employed should be those of a prime quality, gathered when the plant is in flower,¹ making no other reference whatever to either the first or the second year's crop. We quote as follows:

"These² I had found to vary much as to dose, at different seasons of the year; but I expected, if gathered always in one condition of the plant, viz., when it was in flowering state, and carefully dried, that the dose might be ascertained as exactly as that of any other medicine; nor have I been disappointed in this expectation."

During the past fifteen years the writer has cultivated more or less *Digitalis*, but has failed to discover any advantage

Fig. 4. Matured leaves of *Digitalis*, first year growth, much reduced.

that the second year's crop possesses over the mature leaf of the first year, other than that there is a greater number of mature leaves the second year, the crop being heavier than the first year. In the original European experimentation the seed and flowers were also employed in therapy, but soon passed into disuse.³ Withering employed the leaf texture (Fig. 5) after removing the ribs and fibers.

CONSTITUENTS.

So energetic a drug as *Digitalis* became, naturally, an early prey to the interstructural desecrator and the reckless destroyer of natural

¹ The second year is the flowering year.—L.

² The leaves.—L.

³ When assayed by the Keller-Fromme method, the radical leaves of *Digitalis* yield from 0.527 to 0.531 per cent of digitoxin, the flowers from 0.563 to 0.585 per cent, and the seeds from 0.215 to 0.325 per cent. A. Barenstein (*Pharm. Zeit.*, 1910, 56, 128). Hirohashi (*Jour. Pharm. Soc., Japan*), on the contrary, concludes as follows: 1. The small upper leaves of the plant are more active than the large middle and lower leaves. 2. The leaves should be gathered before budding sets in. 3. The flowers seem to contain a larger amount of the active principles than the leaves. 4. The flowers retain their activity for a year, red and white being identical. 5. The seeds are physiologically as active as the leaves and flowers. The stems are poorer in active principles. *Drug. Cir.*, Feb., 1913.

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substances. To the many products created and evolved, seemingly every conceivable play has been made on the name of the drug. Some of these names have been applied and reapplied to materials so different from each other as to lead to hopeless confusion.

Some have been affixed to mixtures of educts, and others to products of manipulation so different, in our opinion, from any natural constituent of *Digitalis* as to lead one to wonder how the plant would view itself, could it know that its tortured flesh had given rise to such a grotesque litter of abnormal, misnamed creations.



Fig. 5. *Digitalis* leaf, pen drawing by Miss Eda Van Guelpen, showing texture and ribs. Much reduced.

Up to the eighteenth century nothing of consequence chemically had been applied to the drug. Thompson, in his *London Dispensatory*, 1811, p. 419, alludes to the fact that Destouches established inorganic compounds of calcium and potassium, whilst Radig found potassium acetate.¹ Thompson also made a personal examination, establishing "a deep-green resinous matter, in which its narcotic power resides." Leroyer, of Geneva, afterward gave the names *Digitaline* and *Digitalia*² to a material made by a circuitous chemical process, in which it is questionable whether the final product had any place in the original drug. After discussions, Thompson sums it up as "an extractive mixture," adding that "the active principle of *Digitalis* is unknown."

Came then Walz (1846-1858), Kosmann (1845-1860), Homolle and Quevenne (1845-1861), Nativelle³ (1872), Schmiedeberg (1874); the last of whom made a most exhaustive research.⁴

From that date to the present, thousands of chemists have sought the secrets of *Digitalis*, all ignoring the natural combinations of organics and inorganics, all seeking a toxic agent as the desirable therapeutic constituent, and all, so far as we can discover, believing that agent to be **organic** only.⁵

Seemingly in it all, natural associations of textural relationship of the or-

¹ The time will come, in our opinion, when such as these will become of great interest. The inorganic side of organic life is not to be lightly passed over.

² The terminations *ine* and *ia* were both once used as alkaloidal affixes. See "The Eclectic Alkaloids," etc., Lloyd Library Bulletin, No. 12.

³ For this research the Orfila prize of 6,000 francs was awarded, in 1872.

⁴ See *Pharm. Journ.*, V, 1875, abstract by Flückiger.

⁵ Likewise the cathartic principle of Senna and Rhubarb becomes largely elusive to the destructive chemist. The agricultural chemist has learned the importance of inorganics in plant foods, so in a time to come must chemists in other directions. The study of textures embracing the natural inorganic compounds is yet to become a promising field.

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ganic and inorganic are ignored. First destroy the natural substance of the drug, then from it create anew, is the idealistic process, which needs no other comment than that, after more than one hundred years of these aggressive destructive methods by the most brilliant chemists, the verdict is by many persons accepted, as by Thompson, in 1811, "still unknown."¹

Accepting our own inadequacy in the attempt to untangle this knot, and our own dilemma in this labyrinth of threads, we arranged with Professor Dr. H. Kiliani, of Freiburg, Germany, than whom there is perhaps no better living authority on Digitalis, to contribute succinctly to this treatise, under his own name, the present standing of the fairly established Digitalis products and educts. This we now present, believing it to be the latest word on the Digitalis constituents, products, and educts.²

CHEMISTRY OF DIGITALIS PURPUREA.

By Professor Dr. H. Kiliani, Freiburg i. B., Germany.

In a critical study of the more important digitalins of commerce (1874), Schmiedeberg (Arch. f. experim. Path. Vol. 3, p. 16) arrived at the conclusion that these preparations were composed mainly of the following principles: *Digitonin*, *digitoxin*, *digitalin*, and *digitalein*, the first a secondary matter, the three others acting upon the heart, *digitoxin* possessing this property in a most prominent degree. My own researches have extended the knowledge of the chemical nature of these substances.

Digitonin I found easily crystallizable from 85 per cent alcohol, and it can be extracted by means of this solvent from water-soluble, commercial seeds-digitalin. When crystallized, *digitonin* is less soluble in water than when amorphous; its solution foams when shaken. It is little soluble in alcohol, insoluble in ether, chloroform, and benzin, and forms an insoluble tannate. The more recent researches yield the formula $C_{54}H_{92}O_{20}$, or $C_{55}H_{94}O_{20}$; warmed with diluted hydrochloric acid, *digitonin* splits into *digitogenin*, $C_{30}H_{48}O_6$, or $C_{31}H_{50}O_6$,³ and four molecules of hexose (galactose and dextrose).⁴ *Digitonin* is inert upon the heart, but as a "saponin"—substance acting haemolytic; this action is annulled by addition of cholesterol (Ransom, Deutsche mediz. Wochenschr., 1901, p. 194), the latter forming the inactive compound *digitonin-cholesterid* (Windaus, Ber. d. d. chem. Ges., vol. 42, p. 238; 1909).—*Schmiedeberg's digitonin* was a mixture⁵ of the just described substance with another completely amorphous "saponin."

Digitoxin, $C_{54}H_{94}O_{11}$,⁶ easily crystallizable, is insoluble in water (when free of other digitalis glucosids or extractive matters); it dissolves freely in alcohol and chloroform, slightly in ether, and is insoluble in petroleum ether (Keller, 1897). Schmiedeberg could not establish the presence of sugar as a constituent of *digitoxin*; he obtained only the amorphous *toxiresin* by the action of acids. I resolved *digitoxin* into crystallized *digitoxigenin*, $C_{22}H_{34}O_6$, and two molecules of easily crystallizable sugar, $C_6H_{12}O_6$, *digitoxose*.⁷ *Nativelle's digitalin* and *Arnaud's digitaline cristallisée* are probably identical with *digitoxin*.

Digitalin (characteristic granules, very little soluble in water, insoluble in ether, chloroform, freely dissolving in alcohol). Schmiedeberg proved this to be a glucosid, but he obtained as product of hydrolysis only a resinous substance (*digitali-resin*). I established the *digitalin* to be a uniform

¹ From time to time enthusiastic searchers have rested their labors on a supposed triumph that, under the touch of others, has proved elusive. Even now not one but several believe the cry is answered by some Digitalis fragment that will influence the heart of a beast.

² This contribution was made November 2, 1909. Possibly, were the article now at his command, the author might revise it somewhat.

³ Ber. d. d. chem. Ges., Vol. 32, p. 2201 (1899).

⁴ Ibid. Vol. 24, p. 341 (1891).

⁵ Arch. d. Pharm., Vol. 243, p. 5 (1905).

⁶ Ber. d. d. chem. Ges., Vol. 31, p. 2457 (1898).

⁷ For constitution see: Ibid. Vol. 38, p. 4040 (1905).

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substance, $C_{35}H_{56}O_{14}$, notwithstanding its refusal to crystallize, and I resolved the pure "*digitalinum verum*"¹ into well crystallized *digitaligenin*, $C_{27}H_{32}O_8$, or $C_{27}H_{30}O_8$, dextrose and digitalose, $C_7H_{14}O_6$.²

Digitalëin.—At first I had questioned the existence of this substance as an individual body, but later researches³ proved without doubt that the seeds and the leaves contain a considerable quantity of an easily water-soluble substance, vigorously acting upon the heart; yet all endeavors to isolate that very decomposable matter in pure condition have thus far proved fruitless.

Cloëtta's *digalen* (like many another similar digitalis-product) contains certainly a high percentage of digitalëin, but it is not proved to be a uniform substance, and Cloëtta's claim of having transformed it into *digitoxin* and vice versa, is surely erroneous.⁴

Tests for digitoxin, digitalinum verum and digitonin.—Keller's test for digitoxin:⁵ Dissolve the substance in glacial acetic acid containing a little ferric chloride; float this solution upon strong sulphuric acid; at the line of contact appears a dark zone, and after a few minutes the acetic acid liquor becomes dark blue (indicating in this way 1/10 of a milligramme of digitoxin in 1 Cc. of acetic acid). This test is more sure and can also serve for *digitalinum verum*, and (negatively) for *digitonin*, when used in the form proposed by me;⁶ 100 Cc. of pure, strong sulphuric acid; and, on the other hand, 100 Cc. of glacial acetic acid are mixed each with 1 Cc. of a solution of 5 g. of ferric sulfate in 100 Cc. of water. Several tenths of a milligramme of the material to be examined are dissolved in 3-4 Cc. of the glacial acetic acid containing ferrum, and beneath this is allowed to flow an equal volume of the afore-mentioned sulphuric acid: *Digitoxin* acts as in the test of Keller (dark blue in the acetic acid), because containing digitoxose;⁷ *digitalinum verum*, on the other hand, colors the sulphuric acid yellow, afterwards red, and finally red-violet, resembling the flower of digitalis. Pure *digitonin*, applied in the same small quantity, causes no kind of color.

Keller's method of determining the amount of digitoxin in the leaves,⁸ produces, according to experiments of Windaus and the author, doubtful values, the product not being uniform.

The older literature contains the description of many substances as *digitalosmin*, *digitasolin*, *paradigitaligenin*, and others, which were surely amorphous mixtures.

PHYSIOLOGICAL ACTION OF TOXIC DIGITALIS PRODUCTS.

The toxic or physiological action of Digitalis on animals, is admirably presented by Pembrey and Phillips, in their work, *The Physiological Action of Drugs*.⁹ In their investigations, they employed the substance known as *Digitaline*,¹⁰ which is itself a mixture of glucosides, among which may be named *digitin*, *digitalein*, and *digitalinum verum*. The substance, however, carries some of the toxic qualities of the drug, as shown by the results, and can well be accepted as an expression of the poison in the drug.

The Effects of Poisonous Doses.—Into the dorsal lymph-sac of a brainless frog are injected 11 minims (0.651 c. c.) of a 2 per cent solution of digitaline (Merck's *Digitalin pur. pulv.*

¹ For preparation see: Arch. d. Pharm., Vol. 233, p. 299 (1895), and Ber. d. d. chem. Ges., Vol. 34, p. 3561 (1901).

² Ber. d. d. chem. Ges., Vol. 31, p. 2460 (1898). Ibid., Vol. 38, p. 3621 (1905).

³ Kiliani and Windaus, Arch. d. Pharm., Vol. 237, p. 458 (1899).

⁴ Münchener mediz. Wochenschr., Vol. 54, p. 886 (1907). Ber. d. d. chem. Ges., Vol., 40, p. 2996 (1907).

⁵ Ber. d. d. pharmaz. Ges., Vol. 5, p. 275 (1895).

⁶ Arch. d. pharm., Vol. 234, p. 273 (1896).

⁷ Kiliani, l. c., and Ber. d. d. chem. Ges., Vol. 38, p. 4041 (1905).

⁸ Ber. d. d. pharmaz. Ges., Vol. 7, p. 125 (1897).

⁹ Published by Edward Arnold, 37 Bedford Street, Strand, London, England, 1901.

¹⁰ This was made by Merck.

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Germanic) in normal tap-water saline. In a few minutes there will be a considerable decrease in the excitability of the nervous system, and in about half an hour there will be complete paralysis, followed by death. An examination of the body will show that the ventricle of the heart is pale and contracted, but the auricles are distended with venous blood. The muscles and nerve retain their excitability for some time after the death of the animal.

Smaller doses, 5 minims (0.296 c. c.), of a 1 per cent solution will produce death after an interval of several hours. The drug possesses an irritant action upon the tissues at the seat of injection, and here causes a darkening and separation of the external layer of the epidermis of the skin.

The Effect upon the Heart.—Two or three drops of a 2 per cent solution of digitaline are now applied to the heart. The effect is seen almost immediately. The ventricle contracts vigorously, but relaxes only slightly during diastole; the tone of the cardiac muscle is greatly increased, and the beats are slower. Further application of the drug will stop the contraction of the ventricle in the systolic phase, but the auricles and sinus will continue to beat.

A larger dose will cause the heart to pass into a firmly contracted condition, and it is killed in the systolic phase. Sometimes the heart at first ceases to beat in the diastolic phase, and a few seconds later passes by a series of slow contractions into the rigid systolic conditions.

During the first stage of the action of digitaline strong stimulation of the vago-sympathetic nerve will cause standstill and relaxation, but in the later stages the effect is less marked.

The Effect upon the Nervous System.—The experiment upon the effect of poisonous doses of digitaline showed that the drug paralyzes the central nervous system. The nerves and muscles are still excitable after the death of the animal.

The Effect upon Muscle and Nerve.—Two muscle and nerve preparations are made, and their excitability is determined by observations of the minimal stimuli. The muscle of one (A) is placed in a 0.5 per cent solution of digitaline in normal tap-water saline; the nerve is placed outside the watch-glass containing the drug. The nerve of the other preparation (B) is placed in the solution of the drug, and its muscle is kept outside on filter-paper moistened with normal tap-water saline solution. The muscle (A) quickly shortens, and shows a great decrease in its excitability when stimulated directly and indirectly; the nerve (B) shows no change.

Digitaline has a marked action upon the muscle, but in ordinary doses does not affect the nerve-trunks.

In connection with the above, we call particular attention to Professor Kiliani's most recent publication (pages 8-9.) It will be observed that *digitalin* Dr. Kiliani describes as "vigorously acting on the heart," but he states that it is so easily decomposable as to forbid isolation. This agrees with our study of this drug, our opinion being that parties seeking the toxic part of digitalis must use the kindest touch, and avoid destructive chemical methods. The representative preparation is rationally a pharmaceutical liquid.

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MEDICAL HISTORY.

Digitalis has been used in domestic medicine from the earliest date, and has been employed for numerous affections that are more or less connected with heart disturbances. The recording of the titles alone of the works of past authorities in medicine, concerning this drug, would require pages. We shall therefore select a few only of these writings that, for our purpose, are most important.

Rayser (chemist and druggist) is authority for the statement that the term "*Foxes glofe*" occurs in the Saxon Herbarium, 1000 A. D., and again, under the name *Cerothecca vulpis*, in a manuscript of the fourteenth century titled *Sinonama Bartholinici*.¹

Welsh physicians² as early as 1233 commended Digitalis in ointment form and in decoction, while both Fuchs (*Fuchsium*)³ and Tragus,⁴ 1552, figured the plant beautifully and gave it much attention, the former introducing the name *Digitalis*. (See page 1.) Boerhaave (*Historical Plants*) considered Digitalis too acid or poisonous for internal use, whilst Alston, of Edinburgh, says, "Though this herb is not now in use, it is almost of as great efficacy as any drug the Indies produce." The *Catalogue of Plants*, by Caspar Schvvenckfelt, 1600, describes Digitalis as a drug in which the *flowers*, used in decoction as a gargle, subdue fever and inflammation, while the *leaves* relieve bowel troubles.

Between this period and 1785 the works on domestic medicine, as well as the English dispensaries, gave passing attention to Digitalis, the comments, however, being largely repetitions of each other, and all being copied from earlier publications. The following, from Salmon's *New London Dispensatory*, 1632, may be cited as typical of the then prevailing opinion concerning the ascribed qualities of the remedy:

Fox-Glove, hot and dry. It is bitter, cleansing, opening, cutting and attenuating: It expectorates thick flegm, if drunk with Mead, takes away obstructions of the Liver and Spleen, is an extraordinary good wound-herb, prevalent against the King's evil, and may be used instead of Gentian. Two handfuls of the herb taken with Polypody $\frac{3}{4}$ iij. helps the Epilepsy.—*Salmon's New Dispensatory, London, 1600.*

In 1783 Digitalis was made official in the Edinburgh Pharmacopœia, "in consequence of the recommendation of Dr. Hope," although Rayser (*Chemist and Druggist*, 1910) states that it had received Pharmacopœial recognition elsewhere as early as 1650. Concerning the 1783 Pharmacopœia, Withering says:

From this, I am satisfied, it will be again very soon rejected, if it should continue to be exhibited in the unrestrained manner in which it has heretofore been used at Edinburgh, and in the enormous doses in which it is now directed in London.

¹ *Chemist and Druggist*, London, X Rayser ii.

² *Physicians of Myddvai*. The domestic physician of Rhys GRYG, prince of South Wales, who died 1233, made a collection of recipes used in medicine at that date in his country. He was assisted by his three sons, the collection being a valuable historical record concerning remedial agents and methods of that date. Of this, two compilations have been issued, the two appearing together, 1861, with a translation by John Pughe (470 pp.). The original manuscript is in the British Museum.

³ Leonhard Fuchs was a Bavarian, born in Memmingen, 1501. In 1524 he graduated in medicine, became involved in religious controversies by reason of becoming a Protestant, was made Professor of Medicine in Tübingen, 1535, and died in 1566. The Lloyd Library contains his publications, as follows: *De Stirpium*, in the following editions:

1545, Latin edition.

1549, French edition.

1551, Latin edition.

1558, French edition.

1673, French edition.

⁴ Hieronymus Bock, known in literature as *Tragus*, was born at Heiderbach, in the Zweibrücken, 1498. Instead of becoming a monk, as was intended, he became a Protestant, then a schoolmaster, and finally a preacher. He practiced medicine, and wrote on Botany. The Lloyd Library has his *De Historia Stirpium*, 1552.

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Came, in 1785, the monumental work of 206 pages, by William Withering, M. D.,¹ who, in the following passage, gives to local empiricism the credit of having excited his interest in this remedy:

In the year 1775, my opinion was asked concerning a family receipt for the cure of the dropsy. I was told that it had long been kept a secret by an old woman in Shropshire, who had sometimes made cures after the more regular practitioners had failed. I was informed, also, that the effects produced were violent vomiting and purging; for the diuretic effects seemed to have been overlooked. This medicine was composed of twenty or more different herbs; but it was not very difficult for one conversant in these subjects, to perceive that the active herb could be no other than the Foxglove.

In the Preface to his book, Withering states his reason for the effort as follows:

The use of the Foxglove is getting abroad, and it is better the world should derive some instruction, however imperfect, than that the lives of men should be hazarded by its unguarded exhibition, or that a medicine of so much efficacy should be condemned and rejected as dangerous and unmanagable.

This antedated the hypodermic syringe as well as the physiological experimenter, but yet Withering intrudes on animal experimentation, for he introduces a description of the experimental action of Digitalis leaves upon a turkey fed with the drug, concluding as follows:

At length he refused all nourishment. On the fifth or sixth day the excrements became as white as chalk; afterwards yellow, greenish, and black. On the eighteenth day he died, greatly reduced in flesh, for he now weighed only three pounds.

On opening him we found the heart, the lungs, the liver and gall-bladder shrunk and dried up; the stomach was quite empty, but not deprived of its villous coat.—*Hist. de l'Academ.*, 1748, p. 84.

In those days of heroic medication it was naturally concluded that a drug that could thus kill a turkey must be a good medicine to cure a human being, a process of reasoning not yet altogether obsolete.

After much discussion with his professional friends, Withering records his opening experiences, as follows:

In the summer of the year 1776, I ordered a quantity of the leaves to be dried, and as it then became possible to ascertain its doses, it was gradually adopted by the medical practitioners in the circle of my acquaintance.

Having stated that the cases he cites were "proven from my own experience," Withering closes his historical Preface by the admirable and conservative summing up of the whole matter as follows:

After all, in spite of opinion, prejudice, or error, time will fix the real value upon this discovery, and determine whether I have imposed upon myself and others, or contributed to the benefit of science and mankind.

Between 1776 and 1785 the Digitalis discussion became very pronounced, and even acrimonious. The entire English medical profession became more or less involved, some considering the drug too poisonous to use, but the majority pushing it to the limit, and lauding its therapeutic qualities.

¹ *An Account of the Foxglove and Some of its Medical Uses, with practical Remarks on Dropsy and Other Diseases*, by William Withering, M. D. Physician to the General Hospital at Birmingham. Published in London, 1785.

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MEDICAL QUALITIES.

To the early uses of Digitalis, as voiced by Salmon in his *New London Dispensatory*, 1682 (see p. 11), nothing of importance was added until the time of Withering, 1785, who reports many cases, chiefly dropsical, successfully treated with Digitalis. Withering practically abandoned the original use of the drug in fevers and bowel troubles, and established the action of the leaf, in substance and infusion, in what is perhaps, even to the present day, the most authoritative experimental clinical record ever made of this drug. The final summing up of his ten years' study and observation is so admirably balanced, both in commendatory and cautionary directions, as to be of exceeding value, even now, and it is to be feared that the rules he laid down as necessary, concerning the dangerous phases of the drug, are now, by many, too often forgotten or neglected, or perhaps altogether unknown. To give toxic doses of Digitalis irrationally where contra-indicated, or to administer it too long or in too great doses, is to invite death. This Withering states most positively, and this he aims to teach his readers to avoid. These final "Rules" of Withering seem to us so important that we venture now to quote them, entire.

WITHERING'S "EFFECTS, RULES, AND CAUTIONS" CONCERNING DIGITALIS.

The Foxglove when given in very large and quickly-repeated doses, occasions sickness, vomiting, purging, giddiness, confused vision, objects appearing green or yellow; increased secretion of urine, with frequent motions to part with it, and sometimes inability to retain it; slow pulse, even as slow as 35 in a minute, cold sweats, convulsions, syncope, death.¹

When given in a less violent manner, it produces most of these effects in a lower degree; and it is curious to observe, that the sickness, with a certain dose of the medicine, does not take place for many hours after its exhibition has been discontinued; that the flow of urine will often precede, sometimes accompany, frequently follow the sickness at the distance of some days, and not unfrequently be checked by it. The sickness thus excited, is extremely different from that occasioned by any other medicine; it is peculiarly distressing to the patient; it ceases, it recurs again as violent as before; and thus it will continue to recur for three or four days, at distant and more distant intervals.

These sufferings of the patient are generally rewarded by a return of appetite, much greater than what existed before the taking of the medicine.

But these sufferings are not at all necessary; they are the effects of our inexperience, and would in similar circumstances, more or less attend the exhibition of almost every active and powerful medicine we use.

Perhaps the reader will better understand how it ought to be given, from the following detail of my own improvement, than from precepts peremptorily delivered, and their source veiled in obscurity.

At first I thought it necessary to bring on and continue the sickness, in order to ensure the diuretic effects.

I soon learnt that the nausea being once excited, it was

doubtful whether it does not sometimes excite a copious flow of saliva.—*Withering*.

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unnecessary to repeat the medicine, as it (nausea) was certain to recur frequently, at intervals more or less distant.

Therefore my patients were ordered to *persist until the nausea came on, and then to stop*. But it soon appeared that the diuretic effects would often take place first, and sometimes be checked when the sickness or a purging supervened.

The direction was therefore enlarged thus—*Continue the medicine until the urine flows, or sickness or purging takes place*.

I found myself safe under this regulation for two or three years; but at length cases occurred in which the pulse would be retarded to an alarming degree, without any other preceding effect.

The directions therefore required an additional attention to the state of the pulse, and it was moreover of consequence not to repeat the doses too quickly, but to allow sufficient time for the effects of each to take place, as it was found very possible to pour in an injurious quantity of the medicine, before any of the signals for forbearance appeared.

Let the medicine therefore be given in the doses, and at the intervals mentioned above: . . . let it be continued until it either acts on the kidneys, the stomach, the pulse, or the bowels; let it be stopped upon the first appearance of any one of these effects, and I will maintain that the patient will not suffer from its exhibition, nor the practitioner be disappointed in any reasonable expectation.

IF IT PURGES, IT SELDOM SUCCEEDS WELL. The patients should be enjoined to drink very freely during its operation. I mean, they should drink whatever they prefer, and in as great quantity as their appetite for drink demands. This direction is the more necessary, as they are very generally prepossessed with an idea of drying up a dropsy, by abstinence from liquids, and fear to add to the disease, by indulging their inclination to drink.

In cases of ascites and anasarca; when the patients are weak, and the evacuation of the water rapid; the use of proper bandage is indispensably necessary to their safety.

If the water should not be wholly evacuated, it is best to allow an interval of several days before the medicine be repeated, that food and tonics may be administered; but truth compels me to say, that the usual tonic medicines have in these cases very often deceived my expectations.

From some cases which have occurred in the course of the present year, I am disposed to believe that the Digitalis may be given in small doses, viz., two or three grains a day, so as gradually to remove a dropsy, without any other than mild diuretic effects, and without any interruption to its use until the cure be completed.

If inadvertently the doses of the Foxglove should be prescribed too largely, exhibited too rapidly, or urged to too great a length; the knowledge of a remedy to counteract its effects would be a desirable thing. Such a remedy may perhaps in time be discovered. The usual cordials and volatiles are generally rejected from the stomach; aromatics and strong bitters are longer retained; brandy will sometimes remove the sickness when only slight; I have sometimes thought small doses of opium useful, but I am more confident of the advantage from blisters. Mr. Jones in one case, found mint tea to be retained longer than other things.

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CONSTITUTION OF PATIENTS. Independent of the degree of disease, or of the strength or age of the patient, I have had occasion to remark, that there are certain constitutions favourable, and others unfavourable to the success of the Digitalis.

From large experience, and attentive observation, I am pretty well enabled to decide *a priori* upon this matter, and I wish to enable others to do the same; but I feel myself hardly equal to the undertaking. The following hints, however, aiding a degree of experience in others, may lead them to accomplish what I yet can describe but imperfectly.

It seldom succeeds in men of great natural strength, of tense fibre, of warm skin, of florid complexion, or in those with a tight and cordy pulse.

If the belly in ascites be tense, hard, and circumscribed, or the limbs in anasarca solid and resisting, we have but little to hope.

On the contrary, if the pulse be feeble or intermitting, the countenance pale, the lips livid, the skin cold, the swollen belly soft and fluctuating, or the anasarcaous limbs readily pitting under the pressure of the finger, we may expect the diuretic effects to follow in a kindly manner.

In cases which foil every attempt at relief, I have been aiming, for some time past, to make such a change in the constitution of the patient, as might give a chance of success to the Digitalis.

By blood-letting, by neutral salts, by chrystals of tartar, squills, and occasional purging, I have succeeded, though imperfectly. Next to the use of the lancet, I think nothing lowers the tone of the system more effectually than the squill, and consequently it will always be proper, in such cases, to use the squill; for if that fail in its desired effect, it is one of the best preparatives to the adoption of the Digitalis.

A tendency to paralytic affections, or a stroke of the palsy having actually taken place, is no objection to the use of the Digitalis; neither does a stone existing in the bladder forbid its use. Theoretical ideas of sedative effects in the former, and apprehensions of its excitement of the urinary organs in the latter case, might operate so as to make us withhold relief from the patient; but experience tells me, that such apprehensions are groundless.

INFERENCES. To prevent any improper influence, which the above recitals of the efficacy of the medicine, aided by the novelty of the subject, may have upon the minds of the younger part of my readers, in raising their expectations to too high a pitch, I beg leave to deduce a few inferences, which I apprehend the facts will fairly support.

I. That the Digitalis will not universally act as a diuretic.
II. That it does do so more generally than any other medicine.

III. That it will often produce this effect after every other probable method has been fruitlessly tried.

IV. That if this fails, there is but little chance of any other medicine succeeding.

V. That in proper doses, and under the management now pointed out, it is mild in its operation, and gives less disturbance to the system, than squill, or almost any other active medicine.

VI. That when dropsy is attended by palsy, unsound viscera, great debility, or other complication of disease, neither

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the Digitalis, nor any other diuretic can do more than obtain a truce to the urgency of the symptoms; unless by gaining time, it may afford opportunity for other medicines to combat and subdue the original disease.

VII. That the Digitalis may be used with advantage in every species of dropsy, except the encysted.

VIII. That it may be made subservient to the cure of diseases, unconnected with dropsy.

IX. That it has a power over the motion of the heart, to a degree yet unobserved in any other medicine, and that this power may be converted to salutary ends.—*Withering*, 1785.

FROM THOMPSON'S LONDON DISPENSATORY.

*On and because of *Withering's* experiments and publications (too often without credit) we find *Dispensatories*, *Pharmacopœias*, and medical writers restating, altering, and abstracting from *Withering's* great work, even to the present. *Thompson*, in his "*London Dispensatory*," 1844, sums up the field of *Digitalis* as follows:

Medical Properties and Uses. *Digitalis* is directly stimulant, indirectly sedative,¹ and diuretic. It at first quickens and fills the pulse; but afterwards weakens the force of all the vital functions; and, by a proper exhibition of it, the frequency of the pulse may be diminished any number of pulsations, and regulated at the pleasure of the practitioner; whilst at the same time it admits, to a certain extent, of the employment of such medicines as increase the firmness of the arterial action, and give tone to the habit. When given to the full extent of which the system can admit, it is apt to accumulate; the pulse intermits; and vertigo, indistinct vision, and nausea with vomiting or purging occur; and if, after these indications, the quantity be still increased, or if any considerable portion of the recent herb be inconsiderately swallowed, it produces delirium, hiccough, cold sweats, convulsions, syncope, and death. It is supposed to quicken the action of the absorbent system; but although the discharge of urine is very considerably increased during its use, and the load of water with which the body is oppressed in dropsies be thrown off, yet it is not easy to conceive how it can operate on the absorbents; and therefore the *modus operandi* of foxglove, in producing its diuretic effect, may be regarded as still unexplained,² although it must probably operate as a direct stimulant to the kidneys.

As a *sedative*, foxglove was early used in some acute diseases, but its powers were not understood. It is employed in inflammatory diseases; in active hemorrhages, particularly from the uterine vessels, when the pulse is sharp, throbbing, and frequent; in scrofula, and in most cases of increased vascular action, or in which it is essential to lessen the usual impetus of the blood, as in aneurism; but in such cases it should be administered in doses sufficiently large to induce, rapidly, its sedative influence. In mania it acts as a narcotic, soothing the nervous system and procuring sleep to the patient. The tincture is the best form of administering it in this disease; and the dose may be carried to an extent far beyond that which can be prescribed in any other disease.

¹ This term implies, as I understand it, any substance which diminishes the action of the heart and arteries, without first increasing it.—*Thompson*.

² Dr. Baidon observed a curious effect of posture in ascertaining the real effects of *Digitalis* on the pulse. When, by gradually increased doses, he took it to the extent of grains vi. in the day, the pulse fell to 40 from 110. But when it was actually at 40, the erect posture would raise it to 100; when sitting, it was 72; and when lying down, 40. He observed the same effect in several patients to whom he gave it.—*Edin. Med. and Surgical Journal*, iii, 271.—*Thompson*.

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It was prescribed in phthisis so early as 1710; and great praises were bestowed on it by a writer of that period.¹ Dr. Ferriar found its utility in this complaint much increased by combining it with myrrh and sulphate of iron;² but it has often proved hurtful in the early stage of the disease. Its use has also been extended to venereal ulcerations, chronic rheumatism, whooping cough, and some spasmodic affections. As an external application, it has long been used in Italy³ to cleanse all sores; and Hufeland recommends it to be used in the form of fomentation for dispelling glandular swellings.

Foxglove has been used indiscriminately to reduce the pulse in inflammation, and in fevers, but upon mistaken principles. It operates more as a narcotic than a sedative. In hemorrhages and diseases of the heart it is also a doubtful remedy.

Let us now close this brief historical record with an extract from Ferriar's *Medical History* concerning Digitalis:

If any person were inclined to write a satire on medical evidence, the different testimonies respecting the properties of this single plant would furnish abundant materials. "It is a diuretic;" says one physician. "It has no diuretic power;" says another. "It is stimulant;" says a third. "It is a sedative;" cries another. "It has no properties at all;" exclaims a fifth.

DR. FELTER ON TOXIC DIGITALIS PREPARATIONS.

The action of toxic preparations of Digitalis, by the mouth, is thus described by Dr. H. W. Felter, in the *American Dispensatory*, (Felter and Lloyd), Vol. I, p. 654:⁴

"When given in medicinal doses, too long continued, or in quantities to exert an immediate action on the system, it causes an increased discharge of urine, reduces the pulse from 70 beats in a minute to 30, with languor, nausea, occasionally anxiety and salivation, a sense of weight, or constriction, obtuse pain in the head, giddiness, disordered vision, mental disturbance, and rarely spectral illusions; not unfrequently a huskiness of the voice is present, the result of irritation of the fauces, trachea, etc. The nausea produced by Digitalis, and more quickly by digitalin and digitoxin, is preceded by malaise, faintness, and depression, and is exceedingly distressing. Vomiting temporarily relieves it, the vomited material being first dark-green, afterward yellow. Prostration becomes so great that the individual can not stand without help, and an intense disgust for food is experienced. Familiar objects are unrecognizable—a disturbed vision with yellowness or blueness supervening. Persons are recognized only by their voices. These effects, if not fatal, may last several days, the sleep being disturbed by nightmare and general unrest. Finally sound asleep and a voracious appetite quickly restore the individual to normal health. If the use of the remedy be persisted in, these effects will continue to increase until the poisonous symptoms, first referred to, become developed. Dr. Fuller states that digitalis stimulates the muscular fibers of the heart, and augments the contractility of the capillaries; when it kills, it does so not by producing paralysis of the heart, but by giving rise to tonic contraction and spasm of that organ.

Let us now present a special paper on the therapy of Digitalis prepared for this treatise by Dr. Geo. F. Butler, A. M., M. D.

¹ Salmon. See *The Edin. Med. and Surg. Journal*, v. 303.—Thompson.

² *Essay on the Medical Properties of Digitalis*.—Thompson.

³ Araldi (Digitalis) tutte piaghe salda.—Thompson.

⁴ Editor of *The Eclectic Medical Journal*, Cincinnati.

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THE OFFICIAL PREPARATIONS OF DIGITALIS AND THEIR POISONOUS ACTION.

By Geo. F. Butler, A. M., M. D., Chicago, Ill.

The action of digitalis has been more carefully studied during the past few years than that of almost any other plant. This study has seemed to be necessary on account of several cases of fatal poisoning occurring on account of giving the official preparations in too large doses, or because of their variation in strength. The cumulative tendency of digitalis, although formerly much disputed, is now established as certain.

Digitalis is a very complex drug, which may account for certain differences in the action of the different preparations. There have been isolated from this plant no less than four so-called active principles: digitalein, digitalin, digitoxin, and digitonin. There may be even more than these. I will not describe the action of these principles, merely stating the fact that some of these substances are to a great extent antagonistic to the others; some are distinctly poisonous, while others have a mild, remedial action; the action of one seems to be a powerful cardiac poison; of another, an active diuretic. Thus the infusion, containing principles soluble in water but less so in alcohol, is regarded as a more active diuretic than the tincture, which produces a greater action upon the heart. The official infusions and tinctures of Digitalis vary in "strength," there being a great difference in their action according to the character of the plants from which they have been prepared.

It is not sufficient to know that Digitalis is a cardiac tonic and diuretic; that it slows and strengthens the pulse and increases the secretion of urine. *You must know your preparation.* Our official preparations are still so uncertain in their action, producing so many dangerous symptoms, even in "medicinal doses," being so prone to so-called cumulative action with its train of untoward symptoms, that a physician must always employ the official preparations with certain precautions. It is well known that frequently, after patients have been taking the tincture or fluid extract of Digitalis for a length of time without any apparent discomfort, the symptoms of Digitalis poisoning come on all at once, without any very notable warning. The pulse becomes much slower, the patient becomes sick, and sometimes we may find the pulse intermittent and feeble, the urine at the same time becoming diminished in quantity. In order to avoid these untoward symptoms we are in the habit of directing our patients to take the Digitalis for a week or ten days, and then to leave it off for three or four days, again commencing the medicine and again leaving it off for a similar interval. We know, moreover, that the drug, after it has been taken for a while, very often tends to overcome sickness of the stomach, and this is usually an indication that the medicine must be discontinued for awhile.

Nearly every physician who has used the official preparations in his practice has had a similar experience to that of Lauder Brunton, who says: "Now as a cardiac tonic you would expect that Digitalis would be useful in all cases of cardiac weakness, and very likely it might be so, but occasionally you will come across, as I have done, cases in which Digitalis, instead of appearing to strengthen the heart, had the reverse effect, and brought on such fits of fainting and threatening of

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sudden death, that the patient was very much alarmed, felt very much worse, and was obliged to give up the medicine."

These cases, in my opinion, are not due so much to conditions contraindicating the use of the remedy, as to an improper preparation of the drug.

Medical literature is full of accounts of the untoward action of Digitalis. Authorities cite the following symptoms as indicating the necessity of withdrawing the drug entirely, or at least of lessening the dose: Nausea or vomiting, or both; anorexia; very slow, irregular, sometimes rapid pulse; "delirium cordis;" headache, giddiness; disorders of sight; diminished quantity of urine; notable reduction of the quantity of solids in the urine.

In toxic or immoderate doses we may have, in addition to the symptoms mentioned above, coolness of extremities, prostration, cyanosis, syncope, coma, and death. Usually death does not occur before the lapse of several days, and may occur after some of the most threatening symptoms have improved, in consequence of sudden cardiac paralysis.

All observers agree that Digitalis has a cumulative action upon the body, and that this action may be due to either (1) its slow elimination from the body and because the effects of one dose are maintained for so long a time that the patient is soon carried to a point beyond tolerance; or (2) not to a prolonged or stronger effect upon the heart, but to an intoxication of the central nervous system, as shown by the following symptoms: emaciation, disturbances of vision, salivation, gastro-intestinal disturbances, as nausea, vomiting, etc.

The symptoms come on suddenly and are alarming in character. They are associated, as a rule, with great gastric disturbances and mild nervous symptoms, but the circulatory disorders are the most distressing to the patient, and the most alarming to the physician. These consist in the sudden change of the full pulse to an irregular, bobbing one, produced by a disturbance of the "cardiac balance." Serious symptoms are sometimes produced by the patient changing his position as by quickly sitting up in bed or attempting to stand erect by the bedside, when from the disordered functions of the vasomotor system and the heart and its supplying nerves the circulation suddenly fails and syncope occurs. Cardiac muscles and motor ganglia begin to fail from overstimulation and there is marked dilatation of the arterioles.

It is strikingly significant that these serious untoward symptoms are apt to occur when ordinary medicinal doses of the official preparations are being administered.

Baker describes two cases where Digitalis having been taken in medicinal doses for "heart disease," produced hallucinations and delirium, the symptoms disappearing after discontinuation of the drug and the use of proper antidotes.

Armstrong reports a case where Digitalis was taken in the form of infusion in doses of $\frac{1}{2}$ to 2 drachms, four times a day. The patient became suddenly faint, tremulous in the limbs, could not see, fell back and died instantly.

Hyden reports a case where the patient was suffering from attacks of renal calculi, with complete suppression of urine. Digitalis leaves in form of hot poultices were applied and patient soon started to urinate, but died from albuminuria.

Many more cases could be cited, showing the poisonous action of Digitalis in even medicinal doses.

In regard to the diuretic effect of Digitalis, some observers

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believe that this action is more pronounced when the drug is given in medicinal doses, and that in toxic doses, or when cumulative symptoms have arisen, suppression of urine may occur, while other observers deny any diuretic action of Digitalis.

Despite the conflicting and unfavorable testimony regarding the action of Digitalis, every physician knows that it is often times a potent and exceedingly valuable remedy.

Notwithstanding, moreover, the unreliability and difference in action of the official preparations, it is nevertheless a fact that the crude drug, or a liquid preparation thereof, possesses certain remedial properties not found in any single active principle of Digitalis. These peculiar, remedial properties of the crude drug, many physicians believe, are more desirable in the majority of cases of cardiac and cardiovascular diseases, than the remedial action of any one single principle; but our official preparations are administered with more or less uncertainty and timidity, owing to the untoward effects which are so liable to follow their employment.

I have long believed it possible to make a preparation from good, active Digitalis leaves, which would contain all the subtle and purely medicinal, or remedial properties of the crude drug as Nature furnishes them to us, excluding the toxic principles—those substances which produce the untoward and poisonous symptoms that I have described.

I believe such a preparation can be made—I am not sure that there is not now such a preparation.

Some seven or eight years ago Prof. John Uri Lloyd visited me at Alma Springs Sanitarium, where we discussed this matter thoroughly. Professor Lloyd later sent me two samples of liquid preparations of Digitalis made from the same batch of leaves, one containing the poisonous, non-medicinal properties of the plant, the other containing mainly the gently-acting, medicinal principles.¹

The contrast in the action of these two preparations was very striking. The latter-named preparation I used in cases of cardiac disease, and continuously, with marked benefit, and with no untoward manifestations whatsoever, although I administered the preparation in doses larger than Professor Lloyd recommended. I am firmly convinced, however, that I have been in the habit of giving too large doses of Digitalis, and that the average physician gives too large doses, not only of Digitalis, but of almost every other drug. There is a decided difference between the gentle, continuous, remedial action of a remedy, and the sudden, repeated shocks to the system occasioned by large doses of a drug. Our methods of administration need to be restudied. The action of remedies in proper doses on sick people, instead of on healthy dogs and cats, is another thing the profession needs to know. One of the most important studies just now for the physician and pharmacist to undertake is the study of the pharmacy and remedial action of Digitalis.

¹ These are described under *Pharmaceutical Preparations*, p. 21, and *Specific Medicines Digitalis*, p. 23.

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PHARMACEUTICAL PREPARATIONS OF DIGITALIS.

Digitalis is a delicate, complex drug, decidedly narcotic, but it is so dominated by the overwhelming presence of its toxic constituents, as to preclude, when given in substance, the influence of the narcotic and other medicinal principles. The usual Pharmaceutical preparations likewise carry the poison in excess, and are indeed valued by official standardizers in accordance with their immediate or direct heart influences. The toxic constituents may be separated from the other, more kindly principles, by appropriate neutral solvents. In this manner, two pharmaceutical preparations of distinctly different qualities may be produced from the same leaves, one dominated by the toxic qualities to the subjugation of all else, the other, (in which are to be found all the volatile constituents of the drug), carrying the aromatic, narcotic and stimulating qualities. Broadly considered, the first of these classes embraces all the Pharmacopoeial attempts at a representative Digitalis preparation. The second, as yet unrecognized by authority, has long been established with Eclectic physicians, who as a rule shun the toxic Digitalis preparations, seldom giving them in large doses, and fearing their cumulative effects, even when given in small doses, if long continued. (See Eclectic Study of Digitalis, pp. 22 to 24.)

The first preparations of Digitalis employed in domestic medicine were the infusions and decoctions of the root, seed, flowers and leaves. As early as 1682, Salmon, in his *New London Dispensatory*, commended Digitalis, in that, "drunk with mead, it takes away obstructions of the liver and spleen." Following these, came the tinctures, but, as a rule, the favored form of Digitalis designed to act violently and directly on the heart, has been the freshly prepared infusion. Withering, the father of Digitalis, discarded the decoction *because the volatile constituent of the drug was lost by the boiling process*. He states,

"The decoction was therefore discarded, and the *infusion* substituted in its place."

Withering also used the dried leaf, in powder. The various pharmacopoeias and dispensatories, following Withering, often recognized Digitalis tinctures. The first edition of the *Pharmacopoeia of the United States*, following European processes, introduced a very weak infusion, 30 grains of Digitalis, 8 ounces water, and 1 ounce tincture of cinnamon, as well as a tincture made of 2 ounces of tincture of Digitalis leaves to a pint of diluted alcohol. During all these years, the freshly made infusion was preferred, this being yet the general favorite when the prompt physiological action of this energetic drug is desired. The dose of Digitalis, as a rule, has ever been heroic, the aim being to bring the patient as soon as possible under its influence. At the best, Digitalis infusion is a risky remedy, and its action needs be very carefully watched, **the same being true of all the toxic preparations of the drug.**

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Infusion of Digitalis.—The present Pharmacopoeial process employs 15 Gm. of the drug in the making of 1000 c. c. of the finished Infusion of Digitalis. The menstruum is water, to which alcohol and cinnamon water are added as a preservative. If the drug is prime, this preparation is comparatively active.

Tincture of Digitalis.—In the present Pharmacopoeia, 100 Gm. of the drug are employed in the production of 1000 c. c. of the finished product, the menstruum being diluted alcohol. The tincture is therefore 10 per cent drug strength. It carries the toxic drug qualities very faithfully.

Fluid Extract Digitalis.—The official preparation is made with diluted alcohol, 1000 Gm. of the drug producing 1000 c. c. of the finished product,

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which is therefore a practically drug-weight representative, the toxic constituents being not altogether extracted.

All these official preparations are toxic in their nature, the menstrua employed being devised for the purpose of representing the poisonous constituents of the drug, which they all fairly accomplish.

No official preparation has as yet been recorded concerning any proximate (isolated) constituent of the drug, of either toxic or other Digitalis quality. In our opinion, this has been a wise precaution.

Let us now contrast with the official preparations and uses of the drug, the Eclectic uses and the Eclectic preparation of Digitalis, to the production of which our care has been chiefly devoted.

THE ECLECTIC STUDY OF DIGITALIS.

Thirty years ago, Digitalis was in great disfavor with Eclectic authorities, the infusion being especially opposed.¹ In 1870, in his great work, *Specific Medication*, Dr. John M. Scudder gave a place to the tincture of the dried leaves, but seldom commended it in his writings, while he altogether neglected the infusion. The reckless use of this dangerous drug served as one of the texts on which specific medication rested. The action of heroic doses, resulting in shock to the heart, either quick or cumulative, was contrary to Dr. Scudder's views of medicines' curative province, aptly voiced by him as follows:—

"As a rule, it is best to change the manifestations of diseased life slowly, giving sufficient time for the organism to adapt itself to the change, and gain increased strength as it returns to the condition of health. It will never do to suppress a process of disease at the risk of suppressing the organism upon which natural function depends.

"As a rule, it is best to effect these changes insensibly, or without shock to an organ or to the entire body. In this, as in all other things, it is the slow but continued application of an opposing force that accomplishes the greatest results. Many thousands of sick have been hurried to their graves by the sudden and forcible efforts of the physician to remove disease. This is one of the most prominent errors of the old practice, and will require considerable effort to avoid.—*Specific Medication*, p. 26-7.

As already stated, the abuse of Digitalis and the deaths that unquestionably followed its reckless dosage, came near excluding the drug, in any form, from Dr. Scudder's publications. They also led to his efforts to replace Digitalis with a non-poisonous drug, and in this object, cactus became a great favorite.

Then it was that this writer, holding the same views and animated by the same ambition as Dr. Scudder, but believing that the toxic qualities, the aromatic qualities, the stimulating qualities and the narcotic qualities of Digitalis were not necessarily to be viewed as a whole, began his study of the drug. It is not an exaggeration to state that hundreds, perhaps thousands of experiments, chemical and pharmaceutical, were made by him in this work. The result of his first five years' experimentation and study led him to accept that by the use of neutral solvents and precipitants, the exclusion of the major share of the toxic constituent could be accomplished in a pharmaceutical preparation, without injuring the interstructural relationships of the other qualities of the drug, but that **chemistry was destructive**. This fact established, the preparation of a comparatively non-toxic, but yet fair representative of the aromatic, narcotic and moderately stimulating textural bodies became a feasible task. The final preparation was

¹ Digitalis was also bitterly opposed by the Thomsonians, it being a tenet of that school to exclude all poisons, vegetable as well as mineral.

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clinically investigated by physicians, who employed it with great satisfaction, and for over twenty-five years with occasional manipulative improvements, this preparation has, with a large circle of physicians, been a favorite under the name **SPECIFIC MEDICINE DIGITALIS**.

To show the continued effort to reach a balanced conclusion, we recall the fact that in 1903 a special visit was made to Alma, Michigan, to discuss with Prof. George F. Butler, M. D., various phases of the subject of drug action. In this conference Digitalis became conspicuous, the statement being made by the writer that the toxic part of the drug had long been excluded from the Specific Medicine, and thrown away. An abundant supply of this excluded poison was next sent Dr. Butler, who was much interested, and reported that he found the action of this substance markedly toxic, whilst the action of the "gently-acting medicinal principles" (Specific Medicine, from the same leaves) was very kindly and beneficial in cardiac disease. (See Dr. Butler's contribution to this study, pp. 18 to 20.)

Thus it is by intent that Sp. Med. Digitalis differs markedly from the infusion and the tincture of the drug, as well as from the fluid extract, and indeed from all preparations toxic in intent, in that its standard does not accord with that of the toxic preparations, accepted by authorities of the present day as the mark of excellence. This necessitates a special article on the preparation named. (See Physiological Action, pp. 23, 24.)

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Characteristics.—Sp. Med. Digitalis has a deep green color, an herby taste, characteristic of Digitalis, and an ethereal odor very characteristic of the fresh drug, and especially pronounced in the residue left on evaporation of the menstruum. It is not as bitter as is the infusion, presenting rather an herby flavor. It mixes practically clear with alcohol, but precipitates with water, which necessitates that aqueous prescriptions be shaken, before taking each dose. The residue left on evaporation has a green color, and is largely soluble in ether or chloroform. When incinerated, but a trifle of mineral residue is left.¹ As already stated, the Specific Medicine is characterized by other qualities than the toxic,² these being partly volatile, and easily dissociated, texturally. The application of heat to the Specific Medicine acts as a disturber of its delicately balanced constitution, while the action of chemical reagents is destructive to its qualities. In consequence of the minor importance of the toxic substances, there should be little physiological (death) action when it is subcutaneously injected. Its solution in water being impossible, its *satisfactory* hypodermic employment is likewise impossible.

Physiological Action of Sp. Med. Digitalis.—Reference to the pharmaceutical history and qualities of the drug, as well as to the foregoing description of the Specific Medicine show that if the object sought in its production has been accomplished, the Specific Medicine should rank low in direct toxic action. That this has been practically accomplished is shown by the admirable and very carefully made investigations of Dr. Worth Hale and Dr. Charles Wallis Edmunds.³ Out of nine commercial preparations of Digitalis, fluid extracts and other products, the Specific Medicine stood

¹ The residue of Sp. Med. Digitalis on calcination left but 2.29 per cent of ash, whilst the residue of the toxic solution of the same drug left 16 per cent. The ash contents vary, however, in different specimens.

² Many other of the Specific Medicines also agree in this, in that they do not accord with accepted toxic rulings. For example, Sp. Med. *Nux Vomica* carries but one-fourth the official strychnine content, as contrasted with the brucine. Sp. Med. *Dioscorea* is practically devoid of the irritant saponin of the crude root, and Sp. Med. *Hydrastis* is practically free from the toxic white alkaloid, *hydrastine*, the same being true of *Lloyd's Hydrastis*.

³ *Bulletin No. 48, Hygienic Laboratory, Treasury Department, Washington, D. C.* The as yet almost insurmountable difficulties in regard to scientific work with this drug or its fractional products are recognized by all, and especially by the authors of this *Bulletin*, who frankly state their difficulties in many directions. Their paper is, however, perhaps the most complete physiological treatise on this drug and its preparations, and this writer considers it unquestionable authority.

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last in the list,¹ as regards its mice-killing qualities. It was, in fact, found to be practically void of lethal qualities, and was so reported. In the experiments on cats, out of ten market preparations, the Specific Medicine, with one exception, (not a pharmaceutical preparation), was the least poisonous. It required 438 parts of the Specific Medicine to kill a cat, as contrasted with 158 parts of the most poisonous.² In the other experiments, all most carefully made, similar comparative results were attained, all showing the low lethal position occupied by Sp. Med. Digitalis. Let us quote as follows: "The 'Specific Medicine' Digitalis, made by Lloyd Brothers, of Cincinnati, offered some difficulty on account of its high alcohol content (80 per cent absolute). If it was evaporated off, a gummy, resinous mass was left, which was very hard to mix with water in such a way as to give uniform dosage. In many cases, to avoid this trouble, the solution was merely exposed in an open vessel at room temperature until part of the alcohol had evaporated, and the residue was then mixed with water to get the desired dilution. The solution thus obtained was always thoroughly shaken to insure a uniform distribution of the precipitate. In one method, namely, the perfusion of the frog's heart, it is not possible to get the full action of the drug, as the precipitate which forms when the drug is added to the Ringer's solution settles to the bottom of the bottle containing the perfusion fluid, and only the soluble portion reaches the heart. It is for this reason that the drug appears so much weaker by this method than by the other methods, in which the animal receives the entire drug. The results of our experiments show that the preparation is uniformly weaker than the pharmacopœial fluid extract."—Page 56, *Hygienic Laboratory Bulletin No. 48; The Physiological Standardization of Digitalis.*

In summing up the subject, Dr. Hale and Dr. Edmunds call attention to the fact that, owing to its high alcoholic content and the abundant resinous water-insoluble constituents, the Specific Medicine could not be satisfactorily employed by them subcutaneously, but in our opinion the toxic components of the remedy were practically abstracted by them, the water-insoluble residues carrying little, if any, poison. Their experiments may be accepted as demonstrating that Sp. Med. Digitalis, as regards its poisonous constituents, stands at the very bottom of the list of commercial Digitalis preparations. Physicians believing that the therapeutic value of a remedy is established by its physiological or toxic qualities, as determined by subcutaneous experiments on the lower animals in health, should not employ the Specific Medicine, for we believe it proven that the Specific Medicine is the most innocent of all pharmaceutical Digitalis representatives.

THERAPEUTIC ACTION OF SPECIFIC MEDICINE DIGITALIS.

The fact that for thirty years the aim of the makers of Sp. Med. Digitalis has been to eliminate from the preparation, as much as possible, the toxic agent of the drug has ever been known to physicians employing this remedy. With a view of establishing whether it is desired by the profession that the toxicity be increased, inquiry was recently made of a number of practicing physicians, the following questions being asked:

1. How long have you used Sp. Med. Digitalis?
2. How does Sp. Med. Digitalis in a therapeutic sense, represent the desirable action of Digitalis?
3. What other forms or preparations of Digitalis have you employed?
4. Have you ever known a death to occur from administration of Sp. Med. Digitalis, even when long continued?
5. Have you ever met an alarming cumulative result from the use of Sp. Med. Digitalis?

¹ Page 35, *Bulletin No. 48, Hygienic Laboratory.*

² Page 36, *Bulletin No. 48, Hygienic Laboratory.*

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6. How does Sp. Med. Digitalis compare clinically with the more poisonous preparations of the drug?
7. Would you advise that Sp. Med. Digitalis be increased in its poisonous action?
8. Do you value Digitalis because of its power to produce death (in animals) or shock to the patient?

Please make remarks concerning the subject Digitalis, in a general or special sense.

To the above questions, replies were received as follows:²

I have used Sp. Med. Digitalis twenty-three years and find that it represents perfectly the desirable action of the drug. I have never known alarming or dangerous symptoms follow its use, and I would not advise that the poisonous action be increased. I have also used the fluid extract, the infusion, and digitaline. Comparing these with the Specific Medicine I look upon the latter as being much superior. The poisonous action of a remedy is not, in my opinion, a standard, therapeutically. I have found Digitalis a valuable remedy in cardiac affections with renal complications, tachycardia and ascites being the leading symptoms.

F. W. Abbott, M. D., Taunton, Mass.

I have used Sp. Med. Digitalis many years, and have always obtained therefrom the desirable action of the drug. I have also used the common tincture, the fluid extract and digitaline, which do not compare favorably with the Specific Medicine. By no means would I recommend an increase of the poisonous action of the Specific Medicine, as I do not at all value its poisonous action. I have never known the Specific Medicine to produce alarming symptoms or show evidence of cumulative action, but I would not advise its prolonged administration, as I would fear cumulative action. Small doses, frequently repeated, strengthen the circulation without depressing the heart. I regard Digitalis as a dangerous agent when given in the doses recommended by many writers on the subject. We should not place reliance upon its primary or toxic action, but rather should fear its dangers.

V. A. Baker, M. D., Adrian, Mich.

I have used Sp. Med. Digitalis thirty years and have always found it reliable and never depressing. For this reason I have never sought other preparations. I have never known death to occur, nor depressing or alarming symptoms due to cumulation. I can not compare it with other preparations because I have never had occasion to use them. I would not advise that its poisonous action be increased, as the therapeutic action alone is what we desire. Sp. Med. Digitalis is a good remedy to give when the heart needs strengthening and where there is dropsical effusion. Given in small and repeated doses, often enough to keep up the desired effect, its action is all one could wish.

F. M. Beals, M. D., Mattoon, Ill.

I have used Sp. Med. Digitalis twenty-five years, and when I have been guided by a correct diagnosis the results have been highly satisfactory. I have also used the infusion in a class of cases, and believe that from it I have had more prompt results in removing dropsical effusions, but I would not continue the use of this preparation for any great length of time, for fear of its cumulative effects. I do not believe the poisonous action of the Specific Medicine should be increased, for, as it now is, I look upon it as a safe remedy, having never known it to produce death or any alarming symptoms from its cumulative effect. I use Digitalis when there is a weak heart, feeble, frequent and compressible pulse. The dose should be small, and frequently repeated.

Eben Behymer, M. D., Mt. Washington, O.

² Where the replies were too long for this treatise, careful condensation has been indulged.

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I have used Sp. Med. Digitalis twenty-one years and have always found it to be a reliable heart tonic and stimulant, perfectly satisfactory when indications were present. I have not had reason to employ any other preparation, as the Specific Medicine has been all that one could desire, and has never caused depression. I have never known death to result from its use, but I have witnessed such an event from the use of the infusion, when used where it should not have been. I have never seen any alarming symptoms follow the use of the Specific Medicine. Its best action, in my hands, has been in weak, overtaxed heart with failing compensation. I make no comparison with other products because I have had no occasion to use any other preparation. As to increasing the poisonous action of Sp. Med. Digitalis, I see no reason whatever for any change, as it is most reliable as now prepared. I place no value upon a knowledge of its power to poison lower animals, as I deem it of use only as a heart tonic and stimulant. I do not consider Digitalis a remedy to be used for every case of irregular heart action; but it is invaluable for weak and insufficient propelling power of the heart muscle. Its action is slow, but effective, if given under proper conditions. For its therapeutic action it should be administered in small doses.

Wm. P. Best, M. D., Indianapolis, Ind.

For twenty-one years I have used Sp. Med. Digitalis, according to Eclectic Indications. It is a reliable remedy and carries all the desirable qualities of the drug. I have not had reason to use any other form of Digitalis, as the Specific Medicine has always been satisfactory to me. I have never known it to produce death or ill effect from a cumulative action. I have used it only where I needed its effect upon the kidneys, and where the heart was also affected. As I do not desire the poisonous action of a remedy, I would not advise that Sp. Med. Digitalis be made more poisonous in its action.

H. H. Blankmeyer, M. D., Aransas Pass, Texas.

I have used Sp. Med. Digitalis over ten years and have always found it to respond to indications. I have also used the infusion. I have never known the Specific Medicine to produce alarming or cumulative effects, and for ten years have avoided the use of any other preparation of Digitalis, excepting in cases where I have desired increased kidney action; then the infusion has been substituted. I would not advise the increase of its poisonous action, because I do not consider that the power to produce death in animals is a criterion of the therapeutic value of a remedy. Digitalis is a drug that should not be used indiscriminately, but only when the indications occur.

Geo. W. Boskowitz, M. D., New York City.

I have used Sp. Med. Digitalis ten years and consider that its action represents the desirable qualities of the drug. I have never known death to occur from the use of the Specific Medicine; neither have I observed any cumulative effect. I would not advise that the Specific Medicine be increased in its poisonous action, for, as it now is, its action is ideal. I do not value a drug for its poisonous action, which is never akin to its therapeutic action. Sp. Med. Digitalis may be used for a long continued period of time as a heart tonic, and a feature which pleases me is, that even after a prolonged administration, it does not lose its power for good. The dose should be carefully graded, and never large.

Charles N. Brown, M. D., Fairmount, Ind.

I have used Sp. Med. Digitalis twelve years and always find it to represent the desirable action of the drug. It should always be given according to Specific Indications. I have used the fluid extract to a limited extent, but I consider the Specific Medicine superior in every way. I have never known death, nor even alarming symptoms from cumulative effect, to occur from the use of this preparation. As we do not desire the poisonous effect of a remedy, I would strongly advise that no increase be made in its poisonous

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action. The physiological power of Digitalis to produce death in animals has no importance in therapeutics; neither do I value its power to shock the patient, as, to be remedial, the effect of a remedy must stop short of such action. Sp. Med. Digitalis given in small doses, as indicated, is beneficial in both functional and organic heart diseases. In the latter, when compensation fails and dropsy results, it is a good remedy. It is also of value in organic disease of the kidneys, with impaired circulation.

Allen Bush, M. D., Morgantown, W. Va.

I have used Sp. Med. Digitalis over fifteen years and have always found that it responded to its indications if my diagnosis was correctly made. I have also used the infusion and fluid extract. Once when I could not get Sp. Med. Digitalis, I used the fluid extract according to the usual dosage, with the result that the shock nearly occasioned the death of the patient. I have never known Sp. Med. Digitalis to cause alarming cumulative or toxic results. When diagnosis is correct, results are always positive and satisfactory. The small dose, frequently repeated, produces all that one need expect. I do not, by any means, advise the increase of dose to toxic action, nor do I attach any importance, therapeutically, to the power of a remedy to cause death in animals, or its physiological shock to the human organism. I use Sp. Med. Digitalis in cases of frequent feeble and intermittent pulse, with enfeebled heart action, and find that the best results occur from small doses, often repeated. The cumulative effect of Sp. Med. Digitalis has never been observed by me.

J. E. Callaway, M. D., Chillicothe, Mo.

I have used Sp. Med. Digitalis twenty-five years, and have found it to be stimulant, without any depressing effects when used correctly. I have never used any other preparation of the drug. I have never seen any cumulative effect or alarming symptoms follow its use, nor do I know of its ever having caused death. I can not make any comparison with other preparations, because I have not had occasion to use others. I would advise not to increase the poisonous action of the Specific Medicine. I value the medicinal action alone of a remedy, and do not desire the effect of shock upon the patient. Sp. Med. Digitalis is a good remedy when used as indicated, but one must not get the habit of using Digitalis for every disease of the heart. Other remedies, such as Cratægus and Cactus, have their specific places.

N. N. Chamberlain, M. D., Canton, O.

I have used Sp. Med. Digitalis twenty-seven years, and value it more than any other preparation of this drug. It has never failed to give evidence that it carries the desirable therapeutic action of Digitalis. I have also used the fluid extract, the tincture and the infusion. Comparing these with the Specific Medicine, the last named is their superior. I have never known death to result from its use, nor any alarming symptoms arise as a result of cumulation. As Sp. Med. Digitalis carries all the desirable therapeutic properties of the drug, I would not advise that its poisonous action be increased. In my employment of drugs for healing disease I do not seek their poisonous action, which is of no practical value to the physician. Whenever the indications for Digitalis are present, the remedy as established will prove satisfactory.

O. S. Coffin, M. D., Indianapolis, Ind.

I have used Sp. Med. Digitalis twenty years, and have always found it to give the desirable effects of the drug. While it slows and strengthens the action of the heart, it has never proven toxic or cumulative to my observation, as have other preparations of Digitalis, and I have never known death to occur from its use. Other forms of Digitalis that I have used are the tincture of the green drug, the fluid extract, and the infusion. Comparing these different preparations, I find the Sp. Med. Digitalis less apt to sicken the stomach, and being less toxic, it can be used for a longer period

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of time than the others, thereby increasing its potency for good. I would not advise an increase in the poisonous action of Sp. Med. Digitalis, as I do not attach any therapeutic importance to the power of a remedy to produce death or shock. In a very interesting case, where other heart remedies had failed, Sp. Med. Digitalis gave prompt relief. After long continued use of this preparation, fearing that the cumulative action of Digitalis might result seriously, I discontinued its use, and substituted other remedies that I deemed less dangerous. In a few days thereafter, my patient began to decline, and in two weeks suddenly expired. I feel sure, now, that this patient would have lived longer, and suffered less, had I continued the use of the Sp. Med. Digitalis.

N. M. Dewees, M. D., Cambridge, O.

I have used Sp. Med. Digitalis ever since it was introduced to the profession, and consider it to be the supreme representative of the drug. I have also used the infusion. I have never known death to occur from the administration of the Specific Medicine; neither have I met with alarming cumulative results from its use. But I do know of many cases where I am sure death was due to the poisonous or cumulative effect of the ordinary toxic preparations of the drug. I consider Sp. Med. Digitalis beyond comparison with other preparations and would not advise any increase in its poisonous properties. I do not feel that we are benefited by a knowledge of the poisonous action of Digitalis, as practiced in animal experimentation. The only preparations of Digitalis that I use are the Specific Medicine and the infusion.

W. M. Durham, M. D., Atlanta, Ga.

I have used Sp. Med. Digitalis twenty-one years, and as far as I have been able to determine, it represents all the desirable properties of the drug. I have never known death to occur from its use, nor any alarming symptoms indicative of cumulative effects. I do not think it would be advisable to increase the poisonous action of the Specific Medicine. I use Digitalis in diseases of the heart complicated with dropsy; also in organic diseases of the kidneys, with the same complication. The remedy, by equalizing the circulation, increases the secretion of urine, thus acting as an eliminant.

D. E. Ensign, M. D., McGrawville, N. Y.

I have used Sp. Med. Digitalis thirty years, and consider that it carries the desirable constituents of the drug. I have never known death to occur from its use; nor any alarming symptoms arise as a result of its cumulation. I would not advise that its poisonous action be increased, as I place no value upon the poisonous action of a drug upon animals, or its physiological effect upon human beings. I use the remedy only when the Specific Indications are present, and its action is then satisfactory.

J. A. Farabaugh, M. D., Clinton, Ky.

I have used Sp. Med. Digitalis thirty years, and have found it as nearly perfect as a remedy can be made. I have also employed the fluid extract, concentrated tincture and the glucoside digitalin. I have never known death to result from the use of Sp. Med. Digitalis; neither have I seen any toxic effect follow its administration. Owing to this fact, I like it much better than any other preparation I have used. I do not estimate the value of a drug by its poisonous effect upon animals, or its physiological effect upon the human being; but rather by its mild, therapeutic action in diseased conditions. Therefore, I would not advise an increase in the poisonous action of the Specific Medicine.

Geo. T. Fuller, M. D., Mayfield, Ky.

I have used Sp. Med. Digitalis thirty years, and have always found the curative or desirable action of Digitalis to be readily obtained from small doses, frequently repeated. With me it has never failed to respond to Specific Indications. I have never known death to result from its use;

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nor have I observed any cumulative action because I never use it in heroic doses. I place no value upon the poisonous action of drugs; nor do I desire their physiological effect upon my patients. I deem Digitalis a drug of corrective power in all cases characterized by a frequent pulse, associated with enfeebled action of the heart. I also find it useful when the pulse is frequent and the urine scanty. In my opinion Digitalis is a drug which should be carefully studied. Much caution should be exercised in its employment.

John W. Fyfe, M. D., Saugatuck, Conn.

I have used Sp. Med. Digitalis twenty-eight years, and find that it represents, therapeutically, the desirable action of the drug. I have also used the infusion. I have never witnessed a death from the use of Sp. Med. Digitalis; neither have I seen any toxic effect from cumulation. I depend almost entirely upon Sp. Med. Digitalis. I would not advise an increase in its poisonous action, because I do not believe we gain anything therapeutically from the poisonous action of remedies, but solely through their medicinal effects. I never use Digitalis unless Specific Indications are present, for under other conditions we have many safer remedies which are far superior in their action as heart tonics. I use it as a diuretic and a depurant. I would advise caution in its use.

M. M. Hamlin, M. D., St. Louis, Mo.

I have used Sp. Med. Digitalis ten years, and find it all that can be desired. I have never used any other form of the drug, so I can not make comparisons. The remedy being perfectly satisfactory as it is, I would not advise that its poisonous action be increased. I do not value a drug on the basis of its power to poison animals, or on its physiological effect upon man. Digitalis has been particularly satisfactory in my hands, in organic heart diseases with dropsy.

J. P. Harbert, M. D., Bellefontaine, O.

I have used Sp. Med. Digitalis eighteen years, and when indicated have always found it produced good results. I have never met an alarming cumulative result from its use. I can not compare the Specific Medicine with other preparations, for the reason that I have had no occasion to use them. I would make no change in the direction of increasing its poisonous action. The poisonous effect of a drug upon animals, or its physiological effect upon the human being, holds no interest for me as concerns the administration of medicine. When Digitalis is indicated, there is no more certain remedy.

J. P. Harvill, M. D., Nashville, Tenn.

I have used Sp. Med. Digitalis fourteen years, and have found it always reliable and prompt in its action. In rare instances I have used the fluid extract, but look upon the Specific Medicine as superior. I have never met with alarming cumulative results from its use. I do not advise to increase its poisonous action. The physiological effect of a drug, or its power to destroy the life of an animal, has to me no significance in the treatment of the sick. When indicated, Digitalis is reliable, but the indications must be present if we expect to get good results.

H. H. Helbing, M. D., St. Louis, Mo.

I have used Sp. Med. Digitalis eighteen years, and have found that it represents the desirable action of the drug. I have also used the infusion and fluid extract. Compared to other preparations of Digitalis, I look upon the Specific Medicine as being their superior. In cases where I was induced by counsel to use the fluid extract or infusion for their physiological action, I have been disappointed in the end result. I have never met with alarming cumulative results from the use of the Specific Medicine. I do not value Digitalis for its power to produce death or shock, and therefore would not advise that its poisonous action be increased. Digitalis is indicated in cardiac incompetency with weakened circulation; in renal

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disease accompanied by ascites and in certain forms of cardiac pain. When indications are closely followed, it rarely disappoints.

M. H. Hennel, M. D., Asheville, N. C.

I have used Sp. Med. Digitalis twenty years, and have found it to carry all the desirable qualities of the drug. I have never had occasion to use any other preparation of Digitalis, hence can not make comparison. I have never met with alarming cumulative results. As the poisonous effect of a drug is not desirable I would not advise that the poisonous action of the Specific Medicine be increased. I do not value a drug because of its power to produce death or shock. Digitalis should be carefully administered in small and frequently repeated doses. The indications should be closely studied. When these are followed, the action of Digitalis will prove satisfactory.

G. A. Hinton, M. D., Hot Springs, Ark.

I have used Sp. Med. Digitalis over twenty years with entire satisfaction, and have never known any untoward results from its use. I have also used the fluid extract when I could not get the Specific Medicine. Compared with other preparations I consider the Specific Medicine superior to all others. I do not think its poisonous action should be increased, because I do not consider this action necessary in its therapeutic use. Considered from a therapeutic standpoint the poisonous action of a remedy is never of value. I would feel at a loss in the treatment of a certain class of diseases without Digitalis. There is no remedy to take its place where we find a feeble, irregular, and rapid pulse. In aged persons where the circulation is retarded with cyanosis, it will give relief when other remedies fail. It has no equal in the treatment of rheumatism of old people with renal complications.

W. N. Holmes, M. D., Nashville, Tenn.

I have used Sp. Med. Digitalis twenty-five years, and have always obtained good results, although I must say that I have prescribed the remedy with a great deal of apprehension, because of its reputed cumulative action. I have never used any other preparation of this drug; as I have felt that the Specific Medicine was the safest. I have never met with any alarming cumulative results from its use, doubtless because I use it in very small doses. I would not advise an increase of its poisonous action. I value a remedy for its therapeutic effect only; not for its power to kill.

Geo. W. Holmes, M. D., Sharpes, Florida.

I have used Sp. Med. Digitalis over twenty years, and believe it represents fully the desirable action of the drug without its depressing effect. I have never known it to produce death or alarming symptoms, even when used for a long time. I have used the infusion at times, but have always been afraid to use the fluid extract. These preparations are not equal to the Specific Medicine. The poisonous action of a remedy is never desirable, hence I would not advise that this property be increased in the Specific Medicine. The tonic effect, only, is desirable. Digitalis is a remedy I seldom use, and never continue long at a time. I never employ it in fever or pneumonia. As a heart tonic it has done good service. It is a good remedy to stimulate the action of the kidneys and reduce edema in the later stages of eruptive diseases.

J. M. Keys, M. D., Omaha, Neb.

I have used Sp. Med. Digitalis thirty years, and have found it to represent fully the therapeutic action of the drug. I have used the fluid extract and infusion, but the best form I have used is the Specific Medicine. I have never met with any untoward results from its use. I would not recommend an increase of its poisonous action. This would not increase the value of the remedy as a medicinal agent, but would make it more dangerous to life. Digitalis is a therapeutic agent whose place can not be taken by another remedy; but to get good results, one must follow Specific Indications. I use it with confidence, when indicated, but only small, frequently repeated

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doses. I remember two cases where it could not be given in any sized dose, as there seemed to be an idiosyncrasy against it. The action of the remedy should be watched very closely.

W. E. Kinnett, M. D., Peoria, Ill.

I have used Sp. Med. Digitalis twenty-eight years, and as it responds perfectly when indicated, I take it that it represents the desirable action of the drug. I have also used the fluid extract, but as the Specific Medicine produces the desired results, I have excluded the more poisonous preparations. I have never met any alarming cumulative results from the use of the Specific Medicine, and I would not advise any increase of its poisonous action. I do not value Digitalis for its power to destroy life, or shock the patient. Digitalis should be administered only when indicated.

Thomas Kirk, M. D., Burr Oak, Kansas.

I have used Sp. Med. Digitalis since 1894, and it has always proved satisfactory to me. As far as I can determine, it represents the desirable action of the drug. I have also used the infusion, when advised by counsel, but it has not been satisfactory. I look upon Sp. Med. Digitalis as being superior to all other preparations of the drug. I have never met with alarming cumulative results from its use. I would not recommend a change to a more poisonous preparation. I do not value a drug for its poisonous action. The indications for Digitalis are not so frequently observed as for other remedies, but when the landmarks are plain, nothing can take its place.

E. J. Latta, M. D., Kenesaw, Neb.

I have used Sp. Med. Digitalis twenty-one years with gratifying success when indications are followed. In order to accomplish good results one must be sure he reads the indications aright; then Digitalis will not disappoint. As concerns other forms of the drug, I feel that I do not need them, as I depend entirely upon the Specific Medicine. I have never known death to result from its administration; nor have I seen any cumulative or poisonous effect. Comparing Sp. Med. Digitalis with other preparations, I look upon it as far superior. I do not value Digitalis because of its physiological or poisonous action, as I always give it in therapeutic, and not in poisonous doses. In heart trouble, complicated with dropsy, I believe I use Digitalis more frequently than any other remedy.

J. D. McCann, M. D., Monticello, Ind.

I have used Sp. Med. Digitalis twenty-three years, and consider that it represents fully the desirable therapeutic action of the drug. I have never used any other preparation of Digitalis. I have never met with any alarming results from its cumulative action. I would not like to have it made more poisonous, as I do not value a remedy upon the basis of its power to destroy life or shock the patient. Digitalis should not be used indiscriminately in heart troubles, but only when the indications are plainly evident.

O. P. McHenry, M. D., Hamilton, O.

I have used Sp. Med. Digitalis twenty-six years, and from a therapeutic standpoint it is in every way and manner all that one could desire. I have also used the fluid extract and infusion. I have never known Sp. Med. Digitalis to cause death; nor have I seen the least ill effects from its use. I prefer it to any form of the drug that I have ever used. The results, clinically, are perfectly satisfactory. I do not think it advisable to increase the poisonous action of the Specific Medicine, as I do not use medicines internally for their poisonous effects, but for their remedial action. I have used Sp. Med. Digitalis in functional and organic heart diseases; in the latter, when compensation has failed and dropsy has appeared. I have also used it in certain forms of organic kidney diseases when there were marked circulatory disturbances. I have always used the Specific Medicine, and when indicated, have never been disappointed.

W. N. Mundy, M. D., Forest, O.

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I have used Sp. Med. Digitalis twenty-five years. It represents all the desirable action of the drug, and when indicated, does not disappoint. I formerly used the tincture in small doses, but it does not compare favorably with the Specific Medicine. From the use of this preparation I have never known death to occur, nor even alarming results to follow, but have seen patients rendered critically ill from the effects of the tincture. I would not advise an increase in the poisonous action, for I do not attach importance, therapeutically, to the toxic power of a drug.

S. B. Munn, M. D., Waterbury, Conn.

I have used Sp. Med. Digitalis twenty-five years, and have not been disappointed in its action when the indications for its use were marked. I consider that in Sp. Med. Digitalis the desirable therapeutic action of the drug is represented. I have also used the fluid extract, but it does not compare favorably with the Specific Medicine. I have never known any unfavorable results from the use of this preparation, and I would not recommend an increase in its poisonous action. I do not in the least estimate the value of a drug, as a therapeutic standard, from its power to poison an animal, or to shock a patient. I use Sp. Med. Digitalis where I find a rapid, feeble and irregular pulse; weak heart action; scanty urine, complicated with dropsy. It strengthens the heart and slows its action, and by equalizing the circulation, increases secretion, especially that of the kidneys. I administer the remedy in small doses, frequently repeated, and do not hesitate to give it for quite a length of time, as I do not fear its cumulative results.

F. J. Neifer, M. D., South Bend, Ind.

I have used Sp. Med. Digitalis twenty-five years, and have always found it to respond to its Specific Indications; hence I am prepared to say that it represents the desirable action of the drug, from a therapeutic standpoint. I have never met any alarming cumulative effects, and having proven that Sp. Med. Digitalis meets the indications perfectly, I would not advise any increase in its poisonous action. I do not believe that the power of a drug to poison animals or produce shock to the patient, has any therapeutic significance. I follow indications closely and administer the remedy in small doses, frequently repeated.

E. B. Packer, M. D., Osage City, Kansas.

For thirty years I have used no other preparation of Digitalis than the Specific Medicine, and have found it therapeutically reliable. I have never known death to occur as a result of its use, though I have administered it continuously, with no cumulative results, for periods of months and even years. Compared with other preparations, I would state that the Specific Medicine is easy of application, positive in results, dosage less in amount: it has no cumulative effect and is often curative. I would most positively advise against increasing its poisonous action, as this would reduce its field of usefulness. I do not value the drug because of its power to produce death in animals, or its physiological shock to the patient, but I do value its action in small doses, upon an old, worn heart, to which it gives a better balance, a better rhythm, and a fuller tone and strength. Digitalis is a remedy I could not dispense with, as nothing equals it for giving tone and strength to the circulatory organs, thereby aiding the movement of the blood both in the arterial and venous tracts. Sp. Med. Digitalis is safe, sane, and right. I have patients who have been taking it every day for six years, and who owe their existence to it entirely.

L. A. Perce, M. D., Long Beach, Cal.

I have used Sp. Med. Digitalis sixteen years, and have found it to act admirably. I look upon it as representing all the desirable, therapeutic action of the drug. I use no other preparation, as I believe it to be the safest. I do not value the poisonous action of a drug, as this is no aid to therapeutic knowledge. I would not therefore recommend an increase in

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its poisonous action. I regard Sp. Med. Digitalis as a very valuable remedy, one that has no perfect substitute in conditions where it is specifically indicated.

W. N. Ramey, M. D., Lincoln, Neb.

I have used Sp. Med. Digitalis fifteen years, and find it represents fully the therapeutic action of the drug. It is a reliable heart tonic, when indicated. In comparison with other preparations of the drug, the evidence favors the Specific Medicine. I have never known it to produce the cumulative results usually anticipated from the fluid extract or infusion. Being perfectly satisfactory as it is, I would not advise increasing its poisonous action, as I do not think the power to poison or produce shock aids in any manner the therapeutic application of a remedy. Given a rapid, weak pulse, with enfeebled heart action, and the Specific Medicine if carefully administered will not disappoint.

C. S. Sackett, M. D., Charlotte, Mich.

I have used Sp. Med. Digitalis eighteen years, and having satisfied myself that it contains all the desirable therapeutic qualities of the drug, I use no other form of the remedy. I have never known it to produce alarming cumulative results. As it is now apparently a safe preparation, I would not advise an increase in its poisonous action. I consider that Digitalis has been overestimated, and its use perverted, as is true of many other remedies. To me its therapeutic field is limited to those diseases showing loss of heart power, as evidenced by rapid heart action; weak, feeble pulse; scanty urine, often complicated with dropsical effusion. It restores the cardiac tone by its innervating action.

Benj. L. Simmons, M. D., Granville, Tenn.

I have used Sp. Med. Digitalis five years, and consider that it carries all the desirable therapeutic properties. I have used no other form of the remedy, excepting the active principle, digitaline. I deem the Specific Medicine superior to all other preparations of the drug. I have never met with any alarming cumulative effects, and under no circumstance would I advise an increase in its poisonous action. Therapeutically, I consider that the poisonous action of a drug, or its power to produce shock, has no value. Sp. Med. Digitalis, when given in small, non-toxic doses, is an opiate to an asthmatic heart. It acts with certainty when specifically indicated. The indications I follow are weak, irregular, rapid pulse; low arterial tension, difficult breathing, deficient urine, edema, cyanosis and cough.

J. B. Standlee, M. D., Peoria, Ill.

I have used Sp. Med. Digitalis twenty-five years. The preparation represents perfectly the desirable action of the drug, when Specific Indications are followed. I have also used the infusion and fluid extract of Digitalis, but always with discretion. I have never known death to occur from the administration of Sp. Med. Digitalis, nor have I seen any distressing cumulative results follow its use, but I never give it in doses sufficiently large to cause poisoning or toxic action. Clinically, the results have been constant and uniform whenever the pathological conditions indicating the remedy were present. I would not advise pushing the dose to its physiological or poisonous action; for in my opinion the poisonous action of a remedy is never desirable, nor is it necessary in order to obtain therapeutic effect. Commenting upon the action of the drug I would say that Digitalis, like all other energetic remedies, has a twofold action upon the human body—one remedial, the other poisonous. In proper doses it raises the arterial pressure, strengthens the heart action, stimulates excretion from the kidneys and skin, and equalizes the circulation. In large and poisonous doses it depresses the heart, causes systolic spasm, dichrotic pulse, and deficient circulation in the general tree.

A. F. Stephens, M. D., St. Louis, Mo.

I have used Sp. Med. Digitalis thirty years, and have always found it to represent fully, when indicated, the therapeutic action of the drug. I

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have also used the infusion and fluid extract, but I regard the Specific Medicine as superior to these. I have never met any alarming cumulative effect from its use, and doubt if such result has ever occurred. I do not value in the least the power of Digitalis to produce shock or death, for this action does not increase our knowledge of its therapeutic properties; hence I would not advise an increase in its poisonous action. Sp. Med. Digitalis has never failed to produce good results in certain nephritic conditions with depressed circulation and feeble action of the heart, if given in small doses, at frequent intervals. The small dose is always reliable, and will not nauseate.

P. J. Stouffer, M. D., Pittsburgh, Pa.

I have used Sp. Med. Digitalis thirty years, and I have found it represents, fully, the desirable action of the drug. Given in small doses, frequently repeated, it is a cardiac tonic. By increasing the power of the heart it equalizes the circulation, and promotes absorption of dropsical effusions. I use no other preparation of the drug. I have never known it to cause death nor any alarming symptoms as a result of cumulative action, though I have given it for a long period of time. I am unable to make comparison with other preparations of Digitalis, because Sp. Med. Digitalis does the work for me when indicated, and I have had no cause to try another preparation. I would not advise that the poisonous action be increased in the Specific Medicine, as I place no value on its power to cause death in animals, or by reason of its physiological shock to the patient. I never use the remedy in cases other than those showing feeble and frequent heart action, and then in small doses only. Using it thus, I never get a cumulative effect.

A. P. Taylor, M. D., Columbus, O.

I have used Sp. Med. Digitalis seventeen years, and when given according to Specific Indications, have always found it reliable. I have never known death to occur from its use, and if given in medicinal doses it will not produce shock in the patient nor show any cumulative results. Being perfectly satisfactory as it is now prepared, I would not advise increasing the poisonous action of the Specific Medicine. I do not use Digitalis indiscriminately, but only when the indications are clearly outlined. Then I can rely upon it.

A. E. Teague, M. D., Indianapolis, Ind.

I have used Sp. Med. Digitalis over nineteen years, and find it perfectly reliable, thus showing that it carries the desirable therapeutic action of the drug. I have used the infusion, tincture, and fluid extract, but prefer the Specific Medicine, as this is more reliable and uniform in its action. I have used the remedy only in conditions which demanded it, and have never met with unfavorable or cumulative results. The preparation has been perfectly satisfactory, and I would not advise any change in its poisonous action, as I do not consider that property of a drug of any value in a therapeutic sense.

Thos. J. Wells, M. D., Erick, Okla.

I have used Sp. Med. Digitalis fifteen years, and find that it fully represents the therapeutic properties of the drug. I have also used the active principle digitalin, but consider the Specific Medicine superior. I have never met any alarming cumulative results from its use. As it does the work in a satisfactory manner and seemingly without danger to the patient, I would not advise increasing its poisonous action. I do not value Digitalis because of its power to kill or produce shock, and do not think a knowledge of these properties is of any importance to the therapist. I never use the remedy as a heart tonic except when the kidneys are also affected and the venous tree congested. My principal use for it is the beginning of eruptive fevers, where we nearly always have disturbance of the venous circulation. I administer the remedy with good results in small doses, frequently repeated.

Ira A. Wheeler, M. D., Healdsburg, Cal.

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I have used Sp. Med. Digitalis twenty years, and when indicated have always found it a reliable heart stimulant. I have never met alarming cumulative results from the use of the Specific Medicine, and this having always proved satisfactory in its effect, I would not advise an increase in its poisonous action. Nothing can be gained, therapeutically, from observing the poisonous power of a drug. I look upon Digitalis as a remedy to be used only as Specific Indications call for it, and these should be familiar to all physicians.

C. H. Wheeler, M. D., Fall River Mills, Cal.

I have used Sp. Med. Digitalis sixteen years, and it has always been satisfactory to me, hence I think it represents the desirable therapeutic action of the drug. I have used the fluid extract, but it was not entirely satisfactory. In some cases of organic heart disease, I have continued the use of the Specific Medicine for a long time, without ever observing any cumulative effect. As the Specific Medicine meets all the requirements, I would not advise an increase in its poisonous action. I do not consider that the power of a drug to poison or produce shock is of any therapeutic value. The indications for Digitalis are low heart power from organic lesion; rapid, feeble pulse; scanty urine; dropsy. The dose should be small, and repeated at frequent intervals.

F. L. Wilmeth, M. D., Lincoln, Neb.

The altogether favorable replies being accepted as representative of the opinion of the profession using the Specific Medicine, the house of Lloyd Brothers will continue their present manipulative process, whereby the toxic constituent of the drug is eliminated to the greatest possible extent from the Specific Medicine. Physicians desiring the action of toxic Digitalis preparations should, in our opinion, use the freshly made infusion, or some other toxic representative of the drug. In using the Specific Medicine, the dose on the label may be moderately increased, and the remedy may be more frequently administered than there recommended, but in so doing it needs be remembered that the axiom of Dr. Scudder, 1870, applies directly in our opinion to Digitalis. From his work we again quote as follows:

"It will never do to suppress a process of disease at the risk of suppressing the organism upon which natural function depends.

"As a rule, it is best to effect these changes insensibly, or without shock to an organ or to the entire body. In this, as in all other things, it is the slow but continued application of an opposing force that accomplishes the greatest results. Many thousands of sick have been hurried to their graves by the sudden and forcible efforts of the physician to remove disease."

Let us now introduce an article by Dr. A. F. Stephens, on the use of the Specific Medicine.

USES OF DIGITALIS

IN ACCORDANCE WITH THE ECLECTIC STUDY OF DRUGS.

By A. F. STEPHENS, M. D., St. Louis, Mo.¹

After long investigation of Digitalis on the basis of the *specific* action of drugs, it has been thus far demonstrated that the remedy acts favorably when the following conditions obtain:—the heart-action is rapid and feeble, which gives evidence of great debility of the heart muscle; the pulse is rapid, weak, and compressible. The loss of contractile power in the cardiac muscles leads to capillary congestion, which is shown by dusky flushing of the cheeks, pale blueness of the lips, etc. Congestion being general, the circulation of all the internal organs is likewise disturbed, which lessens all the secretions, especially of the kidneys; the urine becomes scanty, and if this condition is long sustained, dropsy appears. The pulmonary circulation retarded,

¹ Author of "Essentials of Medical Gynecology." Editor of *The Gleaner* of the Lloyd Laboratory.

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dyspnea and thoracic oppression result, usually accompanied by a dry, troublesome cough.

Tersely stated then, the prominent indications for Digitalis are:—rapid, feeble pulse; weak and irregular heart-action; dusky flushing of the cheeks; dyspnea, worse at night; scanty urine, dropsy.

Taking these indications as a basis, the physician may readily comprehend the class of diseases to which Digitalis is applicable.

Given these symptoms, Digitalis, **carefully** administered, will prove beneficial. **Recklessly** used in the form of **decoction, infusion or the ordinary fluid extract**, the drug is extremely dangerous to life. Owing to its cumulative action, the greatest care must be exercised to guard against its poisonous effect.

The ordinary preparations of Digitalis should never be given in large doses, nor continued for too long a period of time. Intermissions should always be allowed for elimination. I can not too strongly condemn the heroic use of the toxic forms of this remedy, and would urge **extreme caution** in its administration in the forms above mentioned. **To assure safety, use in moderate doses and do not continue for any great length of time.**

I unhesitatingly recommend that whenever Digitalis is indicated the **Sp. Med. Digitalis**, from which the toxic principle is mainly eliminated, be used, as experience teaches that it carries the desirable qualities of the drug, and may be given in proper doses for a long period of time with perfect safety to the patient. In case the physiological action seems urgent, for example in an emergency, after the influence of the drug in its toxic form is attained, the Specific Medicine, properly diluted, should follow. In many cases (for example, after the action of the infusion has become pronounced) the Specific Medicine in small doses, as directed on the label, answers all future needs.

The effect we seek to accomplish is to increase the contractile power of the heart; to restore it to normal rhythm; to overcome congestion and establish secretion and elimination. These results can be brought about without endangering the patient's life by the administration of Sp. Med. Digitalis.

DIGITALIS.¹ (Indications and Contra-Indications.)

By Geo. W. Boskowitz, M. D., New York City.²

Specific symptomatology: Where the heart flags or seems to fail to perform its function.

Physiological action: Many other Eclectic drugs for stimulation of the heart are superior to, and less dangerous than Digitalis. Special substances have been separated from the plant, as: Digitalin, Digitalein, Digitoxin, Digitin, Digitonin; but as many are only compounds of one with the other, their use is not wise.

In its physiological action Digitalis is apt to irritate mucous membranes, hence care must be taken in its administration in gastro-intestinal irritation or inflammation.

On the **Nervous system:** no action, except in very large doses; it appears to be cumulative in its effect on the system.

On **Temperature:** little or no action, except as in the case of the nervous system; large doses will lower the temperature.

¹ From "Extracts from Lectures on Therapeutics," by Geo. W. Boskowitz, A. M., M. D. Delivered at the Eclectic Medical College of the City of New York, 1909-10. Compiled by Victor von Unruh, M. D. Price, (92 pp.) \$1.00.

² Editor of *The Eclectic Review*, New York City. Author of "Therapeutic Lectures" compiled by V. von Unruh, M. D.

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On Circulation: here is its chief influence; it acts as a cardiac and circulatory stimulant; a small amount increases the arterial and the pulse-pressure, slows the pulse and increases the size of the pulse wave; acts on the muscular fibers of the heart, stimulates the Vagus and its peripheral ends. Its action is thus double; acting on the heart muscle it strives to contract the ventricles, and acting upon the Vagus it strives to distend the cavities. In the medicinal dose the even action is obtained; in the increased dose there is great danger from irregularity; a clot might form from the continued action.

On Respiration: its only action here is in its poisonous dose.

As Diuretic: the infusion will act as diuretic, but not in disease of the kidney structure itself, only in simple congestion.

Caution ought to be exercised in its administration, as it is a dangerous remedy and will increase rather than relieve heart difficulties in the conditions of: atheroma, syphilis, fatty degeneration, hypertrophy.

Given in:

Exhaustive fevers; second stage of pneumonia.

As general circulatory tonic, where heart flags and seems to fail in performing its function.

Irritable palpitation of the heart, not the form caused by indigestion.

Pneumonia, where heart flags, where case depends upon general stimulation; it is better than Strychnine here; will whip up the heart to enforced normal action; but it is given only in small doses.

Typhoid, as the fever relaxes and the temperature becomes normal.

Cardiac weakness from shock, collapse, or injury.

It is often useful in the congestion of post-scarlatina nephritis.

In all forms of passive congestions it will equalize the circulation.

The tincture gives no diuretic action; for this purpose use the infusion with Potassium Bromide; but it will not relieve dropsical conditions due to structural disease.

Contraindicated in: Atheroma, Aneurism, Apoplexy, Fatty degeneration, Hypertrophy.

USES OF DIGITALIS.

By Finley Ellingwood, M. D., Chicago, Ill.¹

An Emergency Remedy.—Digitalis is to be first considered in the light of an emergency remedy—as a direct heart stimulant. The indications are shock, feeble and failing pulse, a rapid pulse without force or character—readily compressible, threatening collapse; cool skin, cool perspiration, sighing respiration and threatened heart failure.

Feebleness.—Digitalis is therefore indicated when feebleness characterizes the heart action, the pulse from lack of nerve control being very rapid.

As a heart stimulant.—Digitalis induces temporary irritation of the muscular fibrillæ of the heart, increasing its action by whipping it up. A full dose of any of the energetic preparations, for example the freshly made infusion, may be first given, the effect obtained being continued by the smaller doses of a more kindly preparation, for example, Sp. Med. Digitalis.

Temperature.—Digitalis controls the temperature, to a degree, in any fever that is usually late in its course. If there be asthenia, a rapid, feeble, and uneasily compressed pulse, an irregular heart action, evidences of failure in the vital forces, it should be given in small doses, frequently repeated. Other indications that usually occur in protracted fevers or in prostrating diseases or from shock, demand its use in moderate doses, repeated, and continued as necessary.

Sthenic Stage of Pneumonia.—Digitalis is not demanded in the sthenic

¹ Editor "Ellingwood's Therapeutist," a monthly journal of therapy and descriptive materia medica; author of "Ellingwood's Practice of Medicine," "Ellingwood's Materia Medica and Therapeutics," etc. Address, 32 N. State Street, Chicago, Ill.

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stage of pneumonia, but in the later stages when the disease processes have had full sway, the heart being unable to properly fill the pulmonary capillaries, the heart depressed by the accumulation of carbonic acid within the blood, and the respiration difficult, the infusion should first be given, in full doses, (fifteen minims to the adult, five to ten minims to children), the amount administered being decreased as the effects of the remedy appear, and continued, when necessary, with minimum doses of the Specific Medicine. **Caution.** *In no case must Digitalis be given after the asthenic stage is passed.*

Circulation.—Digitalis will improve the circulation of the brain, overcoming impaired mentality where the heart is feeble, and in acute cases controlling violent delirium and certain forms of mania. In these cases the dose must be in accordance with necessity, care being taken not to overdose.

Kidneys.—Digitalis acts upon the kidneys, by inducing an improvement of the blood pressure in that organ, through its action on the heart, driving the blood through the renal capillaries with renewed vigor, and inducing a more copious flow of urine.

Dropsy.—Digitalis is useful in dropsy, only when the heart's action is impaired. In cardiac dropsy it is therefore always indicated. In general dropsy, due to diseases of the heart, Digitalis is indicated as above, namely, by lack of vital force in the circulation, pulse irregular, intermittent, and feeble, urine present in small quantities with a large percentage of albumin.

Caution.—Caution must be exercised in giving large, full doses of toxic forms of Digitalis, when the heart is greatly impaired. The patient must remain in a recumbent position, and must be informed of the danger of rising to a sitting or standing position. (See also Sthenic stage of Pneumonia.)

Dangerous.—When the arterial tension is high, Digitalis may be considered a dangerous remedy. In aortic stenosis, cases of valvular troubles, where the compensatory dilatation is correctly adjusted for the time, energetically active forms of the agent should be given with caution; but where there is atony or when the compensation is failing, where valvular insufficiency or stenosis is present, it may be the most essential remedy.

DIRECTIONS FOR USE OF DIGITALIS PREPARATIONS.

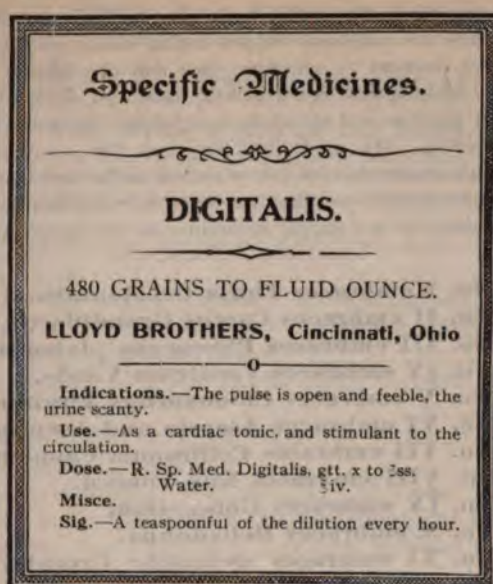
Digitalis preparations are in many forms, some of them being very toxic. This refers particularly to the ordinary Fluid Extracts and the Official Tinctures, and especially to the infusion, when made of an energetic herb. All of these forms of the remedy are likely to produce toxic influences, and should be given cautiously, not pushed to the danger line, and never long continued in heroic doses. When any of these toxic forms are given in any shape, it is dangerous to continue them longer after the drug influence is secured. Prudence then suggests to suspend their operation; but yet to retain the influence of Digitalis. This can be accomplished by means of the Specific Medicine.

In medicinal doses, Sp. Med. Digitalis is comparatively non-toxic, being devoid of the usual unpleasant or dangerous influences of the more active forms of the drug. However, if the patient has a relapse, the toxic form (for example the infusion) may be again admissible, but it should be immediately abandoned for the Specific Medicine on its influence being again established. The Specific Medicine should then be continued, as before, in non-toxic doses as directed on the label. By this method, the prompt action of toxic Digitalis is first obtained, and then continuously fortified, without danger to the patient.

Physicians conversant with the use of the Sp. Med. Digitalis comprehend that by increasing or decreasing the dose, this preparation of Digitalis can be long used without cumulative danger. Indeed, a great many physicians find the Specific Medicine all-sufficient in itself, and seldom find it necessary to give the more toxic forms of the drug.

Original Label of Specific Medicine Digitalis.

(Used continuously since 1870).



The aim has been to exclude from Specific Medicine Digitalis the cumulative, toxic constituents of the drug (see pages 22-24). In this connection, the apt remarks of Dr. John M. Scudder seem particularly to apply to Digitalis:

"As a rule, it is best to change the manifestations of diseased life slowly, giving sufficient time for the organism to adapt itself to the change, and gain increased strength as it returns to the condition of health. It will never do to suppress a process of disease at the risk of suppressing the organism upon which natural function depends.

"As a rule, it is best to effect these changes insensibly, or without shock to an organ or to the entire body. In this, as in all other things, it is the slow but continued application of an opposing force that accomplishes the greatest results. Many thousands of sick have been hurried to their graves by the sudden and forcible efforts of the physicians to remove disease. This is one of the most prominent errors of the old practice, and will require considerable effort to avoid."—*Specific Medication*, pp. 26, 27.

We urge physicians desiring the more poisonous preparations of Digitalis to use either the infusion or some other more toxic form of the drug.

Prices of Specific Medicine Digitalis.

1 lb. package.....	\$2.25 each.	
½ lb. package.....	1.15 each.	
¼ lb. package.....	.60 each.	By mail, 82 cents each.

These preparations are neatly cartoned. The label of each carries therapeutic uses and prescription directions.

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We issue systematically special treatises (historical and therapeutical, 16 to 48 pages each) on invaluable drugs, both new and old, and their therapeutical preparations. These are encyclopedic, and highly valued for their intrinsic worth. They are in great demand by scientific men and physicians, for they give the authentic history, description, constituents, uses, and doses of each drug. The medical uses and qualities and scientific descriptions are written for each treatise by selected authorities. We mail these treatises free, on application, to physicians only. In this connection we call attention to the fact that our preparations are restricted to physicians' use, that we make no remedies for popular use, and that we neither advertise nor supply medicines for the home cure of disease.

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- Treatise No. VII embraces Collinsonia Canadensis.**
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- Treatise No. XXIII embraces Hydrastis Canadensis.**
- Treatise No. XXIV embraces Resinoids, Alkaloids, and the so-called Eclectic Concentrations.**
- Treatise No. XXV embraces Glycyrrhiza and the History of Neutralizing Cordial.**
- Treatise No. XXVI embraces Digitalis.**
- Treatise No. XXVII [in press] will embrace Coca.**

LLOYD BROTHERS, Cincinnati, Ohio.

A TREATISE ON COCA (Erythroxylon Coca).

"The Divine Plant of the Incas."

"The leaves of the tree are for the healing of the nations."—Rev. 22: 2.
"And the leaf thereof for medicine."—Ezek. 47: 12.

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The pen drawing, page 5, is by Miss Eda Van Guelpen; the map and all illustrations, excepting Fig. 13, are by John Thomas Lloyd.	
The portions included in pages 3 to 14 were contributed, in advance, to the American Pharmaceutical Association, meeting in Nashville, 1913.	
The History, pages 3 to 5, the Therapeutical History, pages 15 to 21, and the record of Erythroxylon Coca in Eclecticism, pages 24 to 27, are by John Uri Lloyd, who edits the Treatise. Pages 3 to 14 were contributed to the American Pharmaceutical Association, Nashville, 1913.	

Drug Treatise Number XXVII.

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HABIT-FORMING DRUGS.

Coca is now of exceptional importance in that from it is derived the greatest habit-forming drug, (Cocaine), of recent times. The following pages bear several references to the fact that the Eclectic School in medicine was established as a protest against the heroic and harmful in medication, including such as this. Opium was the chief habit culprit, and received continual Eclectic attack, the following editorials from the pen of John M. Scudder, M. D., being expressive illustrations:

The Abuse of Narcotics.—One would think that enough had been said in this Journal to impress its readers with the necessity of using narcotics with great care, but it seems almost impossible to make physicians understand that these remedies will kill, and do kill their thousands. . . . I know that thousands are killed yearly with opium and its alkaloids, and I say to-day, as I have said for many years, that this drug kills more people than mercury, antimony, arsenic, or the lancet. It kills the young, the middle-aged, and the old, and when it fails to kill, it impairs the health, or leaves an intemperance which eventually destroys the body and mind.—*Eclectic Medical Journal*, 1874, pp. 380, 381.

The Use and Abuse of Opium (Habit-forming Drugs).—You tell me that you find it impossible to dispense with opium or its salts in practice, for your patients must have relief from pain. You have tried various plans, but they have all failed, and you have been forced to fall back on Opium and Morphine. I have had this repeated to me so often that I conclude many of my readers have reached these conclusions. . . . It strikes me that when a man says he can not do without a drug, the best argument is to show him that thousands of physicians have done without it, and had quite as good success, perhaps better success, than those who employ it. . . . I know that opiates can be dispensed with, and I know it in just the same way as an original Thomsonian or Homeopath knows it,—by actual experiment. And I know, further, that disease is much more easily cured without, than with, Opium or Morphine.—*Eclectic Medical Journal*, 1887, p. 189.

The Opium Habit.—The man who carries a hypodermic syringe in his pocket, and injects his arm or thigh twice or three times in twenty-four hours to allay nervousness and to make him feel better, is under the influence of a habit potent enough to last him to the grave, whether death be near or distant. The woman who has a vial of something in her bureau or reticule to overcome bad feelings or to influence a disagreeable sensation, and recurs to this vial every day, though she may ignore any such practice, is under the beguiling influence of "opium taking."—*Eclectic Medical Journal*, 1884, p. 352.

A New Dispensation.—Opium eating, the accursed habit that renders so many lives miserable, is to be charged to the profession of medicine. Physicians know the wrong, and yet continue to prescribe the drug in the most reckless manner. I will assert that it is not needed once in twenty times, where given, and my experience will warrant the statement that it need not be used at all.—*Eclectic Medical Journal*, 1886, p. 346.

The Use of Narcotics.—Can I practice medicine successfully without opium, morphine, or chloral? I have done it, and I could do it again,—more successfully, I think, than if I were to use them. How do I get along with cases where there is pain, restlessness, or want of sleep? I remove the causes of this nervous disturbance, and I have radical relief.—*E. M. Journal*, 1888.

Anodynes in Disguise—And the Harm They Do.—We are rapidly acquiring the reputation of being opium eaters. To stay this tide, let the profession of medicine set its influential and scientific foot heavily upon the necks of those who are clandestinely poisoning the innocents. Away with opiated soothing syrups—away with genteel opium taking,—away with harmful drugging with anodynes, and let us frown meaningly upon excessive indulgence in strong drink.—*Eclectic Medical Journal*, 1884, p. 244.

Lloyd Brothers Drug Treatise No. XXII devotes several pages by Dr. Waterhouse to the "Eclectic Substitutes for Opium." It is mailed free to physicians.

COCA

"The Divine Plant of the Incas."*

HISTORY.—*Erythroxylon coca* is a small tree or bush native to the slopes of the Andes (see p. 11), where, especially in Bolivia, large plantations are cultivated. The leaves have been highly valued, from the earliest records, by the natives of Peru, Chili, Colombia, and Bolivia, the tree being called "The Divine Plant of the Incas." In 1569, Monardes (1), of Seville, published an article on the drug, reproduced, 1577, in London. (Dowdeswell (2).) This is among the first references to the drug in print, known to us, and it was followed by the botanical description, by Clusius (3), in 1605.

The history of Coca, in its many phases, is presented by several travelers and authors, one of the first of these to introduce it to Europeans being W. J. Hooker (4), in his "Companion to the Botanical Magazine," London, 1835. Several pages of this work are devoted to the South American uses of Coca, the same being credited to Dr. Poeppig's "Reise in Chile, Peru, und auf dem Amazonenstrom." From this historical contribution we present (see pp. 4 and 14) portions pertinent to the Coca subject.

Among the most interesting of the more recent publications treating of Coca is a large illustrated volume of near 600 pages, by W. Golden Mortimer, M. D., under the title, "Peru, History of Coca," New York, 1901. From this work we also gain much insight into the early history and customs of the Coca users, as indicated by the passages that follow.

That Coca was honored in their sacred ceremonies by the natives of the lands producing it, is evidenced by the following "recital" (5) addressed to the sovereign:

Oh, mighty lord, son of the Sun and of the Incas, thy fathers, thou who knoweth of the bounties which have been granted thy people, let me recall the blessings of the divine Coca which thy privileged subjects are permitted to enjoy through thy progenitors, the sun, the moon, the earth, and the boundless hills.

A plant so regarded necessarily fell under the adverse criticism of the devoutly religious, early Spanish explorers, who naturally directed their efforts against everything that, in their opinion, constituted a part of heathen worship and diverted the natives from the true God. This is shown by the following quotation from Mortimer:

In 1569 the Spanish audience at Lima, composed of bishops from all parts of South America, denounced Coca because, as they asserted, it was a pernicious

*Part of this historical record is from a paper first published in the *Practical Drug-gist and Pharmaceutical Review of Reviews*, October, 1910. Republished in *Lloyd Library Bulletin*, No. 18, "History of the Vegetable Drugs of the Pharmacopeia of the United States," by John Uri Lloyd, 1911. This, as well as the contribution of John Thomas Lloyd, is from a paper contributed to the American Pharmaceutical Association, 1913.

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leaf, the chewing of which the Indians supposed gave them strength, and was hence: "*Un delusio del demonio.*"

In this connection the following quotation will indicate how distasteful are the methods of the natives, even yet, to those whose first duty consists in suppressing such ceremonies as are therein described:

When the period for departure (on a dangerous journey.—L.) actually arrives, the Indians throw Coca in the air, just as did the Incan priests of old, to propitiate the gods of the mountains, who, presumably, do not wish their domains invaded.

The native Indian use of Coca was unquestionably exhibited where it was necessary for men to make the most exhausting physical effort, as the Indian "runners" of the Andes, carrying with them a modicum of food or other burdens. A few coca leaves sufficed as a hunger pacifier, and upon this as a basis the runners underwent the most exhausting and exacting journeys. It was accepted by observing travelers that the leaves, being chewed, would yield an abundance of "vital strength." The endurance of people thus employing the drug is noted also by the Jesuit Father Blas Valera (6) under the name *Cuca*. After observing the methods of the Jesuit explorers, he writes as follows:

It may be gathered how powerful the *Cuca* is in its effect on the laborer, from the fact that the Indians who use it become stronger and much more satisfied, and work all day without eating.

In further support of this phase of the Coca subject, Dr. Poeppig, in the beginning of the last century, records as follows, in his work on Chili and Peru:

The miner will perform, for twelve long hours, the formidably heavy work of the mine, and, sometimes, even doubles that period, without taking any further sustenance than a handful of parched maize, but every three hours he makes a pause for the purpose of chewing Coca (*coqucar*). He would work ill and reluctantly if the proprietor let him want his favorite herb. . . . The same holds good with the Indian, who, as a porter, messenger, or vender of his own productions, traverses the Andes on foot. Merely chewing Coca from time to time, he travels with a load weighing one hundredweight, on his back, over indescribably rough roads, and accomplishes frequently ten leagues in eight hours. During the Revolutionary War the undisciplined Patriot troops, chiefly consisting of Indians from the Sierra, by dint of ample supplies of Coca and brandy, traversed long distances in a very short time, and thus became very dangerous to the Spaniards. Where Europeans would have halted and bivouacked, the ill-clad, barefooted Indians merely paused, for a short interval, to chew their Coca.—From the "*Reise in Chile, Peru,*" etc., of Dr. Poeppig. *Companion to the Botanical Magazine*, by W. J. Hooker.

These reviews and descriptions, showing conditions in times gone by and reaching backwards to the earliest European ac-

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quaintance with that land, are remarkably supported by the methods of the Indians yet out of reach of civilization. As a record of these conditions, we introduce herewith a recent description by Mr. J. T. Lloyd, as follows:

THE MOMBREROS (COCA USERS) OF COLOMBIA.

By John Thomas Lloyd.*

The Journey.—The Andes Mountains (see map, Fig. 1) appear in Northern South America as three distinct ranges, which soon before leaving the Republic of Colombia, unite to form a single chain. Only a short distance north of their place of union we crossed two ranges of these mountains, descending thence by way of the Magdalena River, whose course we followed from its very source until it emptied into the Caribbean Sea.



Erythroxylon Coca, natural size. Pen drawing by Miss Eda Van Guelpen.

lomas grew continually larger and rougher, until reaching Popayon, which, situated at an altitude of more than 6,000 feet, lies fairly

Entering Colombia at the little seaport town of Buenaventura, on the Pacific Coast, we first climbed the Western or Coast Range of the Andes, descending thence to the city of Cali (altitude, 3,300 feet). From Cali we traveled south of southeast, following the valley of the Cauca River, to the inland city of Popayon, this being a seven days' trip for pack animals. During the first two days' travel, the valley was almost as flat as a sheet of water, and very fertile. In the evening of the second day we entered the "lomas," or foothills, where the mountain chains begin to fuse. These

*In the early winter of 1912 two young men from Cornell University visited regions of Colombia that are almost unknown to the scientific world. Mr. A. A. Allen, from the department of Zoology at Cornell, was conducting research for the American Museum of Natural History, and Mr. Lloyd, assistant in Limnology, was independently studying the insects. Their observations of the Indians' methods of using Coca are recorded by Mr. Lloyd in this publication.

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against the Central Range. Beyond Popayon the trail followed a very meandering course through the mountains, to the little town of San Sebastian. From this town we started the ten days' journey across the Central Range to the village of St. Augustin, the uppermost town in the great mountain-enclosed valley of the



Fig. 1.

Map of the part of Colombia, South America, explored as shown by dotted lines, Colon to Santa Marta.

Magdalena River, which heads in two small lakes and flows between the Eastern and the Central Ranges of the Andes to the Caribbean Sea.

During five days of this trip, which included the crossing of the "Paramo," as the part of the mountains lying above timber line is called, our cargoes (packs) were carried on the backs of Indian

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porters, the trail being impassable to loaded mules. From St. Augustin we went down the valley of the Magdalena River to the Caribbean Sea, where we left Colombia.

The People.—The inhabitants of Colombia, as we met them, were whites, blacks, and Indians, as well as mixtures of the three races in all conceivable degrees. On the Pacific Coast, where we entered the country, the inhabitants, excepting two or three foreigners, were all Negroes, who showed little sign of other blood in their veins. After commencing the ascent of the Western Range, we saw evidence of some white, and occasionally a small amount of Indian blood in the population, but on both slopes and up the flat, fertile part of the Cauca Valley to the lomas or foothills of the Central Range, the Negro element predominated. After entering the lomas the Negro blood soon disappeared, being replaced by a mixture of white and Indian, the white element usually dominating. This condition continued as far as San Sebastian, although in the vicinity of Popayon and beyond a large number of pure-blood Indians were encountered on the trail. These Indians live in secluded mountain homes, difficult of access and away from the main trail. After leaving San Sebastian the only people seen on the trail were of pure Indian descent, until we reached St. Augustin, on the eastern slope of the Central Range, where white blood again began to be in evidence, mixed with the Indian. In the Magdalena Valley, beyond St. Augustin, the Indian blood was diluted with a constantly increasing amount of white blood, until finally, even before reaching the town of Neiva, the white blood predominated, sometimes excluding all evidence of Indian ancestry. In the vicinity of Neiva Negro blood again appeared, and below this point, on the Magdalena River, very shortly overshadowed all evidence of other than African origin. In the coast towns of the Caribbean Sea, however, there are many Europeans and Americans.

Coca and Coca Users.—In the Negro country of the Western Coast, and as far up the Cauca Valley as the lomas, as well as in the lomas themselves, where a fair amount of white blood prevailed, we saw no evidence of coca using. The habit was first observed by us in the vicinity of Popayon, among the full-blooded Indians traveling on the trail. Here the way was marked by blotches of saliva. In stature the Indians were rather short, but well built and very muscular. Their color was dark, decidedly red when wet, and their teeth and lips were deep-stained with Coca. In physical appearance they were by far the best specimens we had seen in Colombia, up to this time. With heavy loads on

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Fig. 2.

Indian Pack Carriers of the Andes (see also Figs. 3 and 4). Coca bag shown at the side of each. Cheeks puffed with Coca. (See also Fig. 10.)



Fig. 3.

Indian Pack Carriers of the Andes. (See also Figs. 2 and 4.)



Fig. 4.

Indian Pack Carriers of the Andes. (See also Figs. 2 and 3.)



Fig. 5.

Indian Woman, showing "Guambi" or Coca Bag.

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their backs, of market stuffs in woven bags, men and women walked very rapidly, or even ran for long distances along the trail, showing no signs of fatigue from their exertion. (Figs. 2, 3, and 4.) The cheeks of all bulged with the leaves of Coca. (Fig. 2, left-hand figure, and Fig. 10.) At their side they carried their supply of the drug in small, close-woven fiber bags (Fig. 9) of about a quart's capacity, but these were seldom more than a third filled. (Shown in Figs. 2, 4, 5, and 9.)

Coca Market.—About noon of the day on which we first saw coca in use by the Indians on the trail, we reached the town of Popayon. It being Friday, the principal market day of the week, we found all kinds of foodstuffs for sale, but the leaves of coca far exceeded in importance any other item, even the necessities of life. The leaves were contained in large, native, woven bags and were sold by weight from rude balances, the pans of which were gourd shells, and the weights, stones (Figs. 6 and 7). A few of the market people offered lime for sale, which was weighed in the same crude manner as the coca leaves.

Here, in the Popayon market, we first became familiar with the manner in which the Indians use the coca leaves. At their sides all wore the small, woven bags, called "Guambis" (Figs. 2, 4, 5, and 9), a name that applies also to the large bags in which the Indians carry their packs. In the coca guambi the dry leaves (fresh leaves never being used) are carried loose (Fig. 8), together with a small gourd (called "mombero"), pierced at the stem end by a round hole (A A, Fig. 9), and corked with a plug of wood (B, Fig. 9). In the gourd is a small amount of lime, called "mombi" by the Indians. This is ground to powder, or carried in small lumps. Invariably the coca user, immediately after putting the leaves in his mouth, mixes them with lime.

Between Popayon and the ridge of the Central Range of the Andes we visited, during market days, the towns of La Sierra and Almaguer. In each of these places we saw coca sold and used in the same manner as in Popayon.

Method of Using Coca.—The Indians first fill the mouth with the dried (never green) leaves (Fig. 10), and then pour from the gourd into the palm of the hand a small amount of lime, perhaps the bulk of two or three peas. This is then mixed in the mouth with the leaves, the whole lump being then pushed by the tongue, without mastication, into one cheek, until that side of the face fairly bulges (Fig. 10, also Fig. 2). The leaves are not chewed, but occasionally the wad is turned with the tongue. From time to time more lime is added, but a single mouthful of the leaves lasts several hours.

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Fig. 6.

Coca Dealers in Market at Almoquer.



Fig. 7.



Fig. 8.

Broken Coca Leaves as carried in "Guambi."
(See Fig. 9.)



Fig. 9.

Coca Bags ("Guambi") with Lime Seeds (A)
and Stopper (B).

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Distribution of the Coca Shrub.—In the mountainous district between Popayon and San Sebastian could be seen, in the doorway of almost every house, a small patch of coca bushes, which



Fig. 10.

Showing Coca user's cheek bulged with the leaves. (See also Fig. 2.)

not only occupied the choicest parts of the garden sites, but also showed signs of much more care and cultivation than was given the other garden crops. After our attention was called to the coca bushes, we recalled having seen them cultivated in the vicinity of Cali, where they grow in far greater luxuriance than in the higher altitudes. In the upper ranges, above the highest altitude at which the coca plant will grow, we learned that the leaves used are all obtained from the lower country, around Cali, where the drug is of far better quality than that grown at high altitudes in the mountains. In

the region of Cali (3,300 feet) the plant exceeds ten to twelve feet in height, but decreases in luxuriance as the mountains are ascended until, at 8,000 to 9,000 feet, it becomes a mere shrub of two or three feet. At an altitude of 10,000 feet it disappeared altogether. Although the coca raised around Cali is of the best quality, the inhabitants of that town do not use it, and during our daily visits to the Cali market we did not see the drug offered for sale.

Coca Considered Indispensable to Indian Pack Carriers.—After leaving the small town of San Sebastian, we ascended rapidly to the high valley (altitude about 10,000 feet), called La Valle de Papas. Here we lived about two weeks in the family of an old Indian named Don Pedro, where observation of the habits of our hosts gave us ample opportunity to observe how highly the Indians prize the coca leaves. On one occasion, when starting with Don Pedro as a guide to a distant lake at a much higher altitude, he told us that

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unless we used the drug we would be unable to withstand the fatigue of the journey, which would be exceptionally severe. To test the virtues of coca, as well as to quiet his fears, we filled our mouths with the leaves, which were almost tasteless, and as our



Fig. 11.

Open shed, resting-place for the night on the Andes.

guide assured us, without value until lime was added. But the addition of the lime rendered the mixture so disagreeable that, to Pedro's disgust, we spat it out and decided to forego the possible benefits of its use.

The Paramo.—Having left La Valle de Papas, we started across the Paramo, as the lofty summit of the Andes above timber line is called. On this trip the dozen Indian porters who carried our cargoes all consumed coca unceasingly while on the march. After eating a simple breakfast of ground corn porridge ("mazamora"), they would start with their heavy packs, weighing from seventy-five to more than a hundred pounds, strapped to their backs (see Figs. 2, 3, and 4). All day long they traveled at a rapid gait, over steep mountain spurs and across mucky swamps at an altitude that, to us, without any load whatever, was most exhausting. On these trips the Indians neither rested anywhere nor ate at noon, but incessantly sucked their wads of coca throughout the entire day. At night they ate a heavy meal of either "mazamora" or rice, and sometimes a hot drink of "panela" (brown sugar) dissolved in hot water. Meat they seldom, if ever, tasted. Then they lay down to sleep on the cold, bare ground in a half-open shed (Fig. 11), with no cover other than the capes that had shed the rain during

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the day, awakening at daybreak to eat their breakfast and start again on a long day's journey over the rugged mountains.

When we tried to buy coca outfits from our porters, at first we met with absolute failure, but finally persuaded two of them to part with their treasures (Fig. 9) in exchange for tin tobacco boxes and a small sum of money. To test them we also tried to buy their entire supply of coca leaves and lime, but these they positively refused to sell, insisting that without the coca they could not carry their packs to the journey's end.



Fig. 12.

One of many prehistoric monuments, origin unknown, near San Augustin.

Coca Users.—These Indians we found very pleasant, always cheerful, happy, and good natured, in spite of the fact that their daily toil subjected them to the severest of hardships and the most frugal fare. Barefooted they travel over rocks and through swamps, amid cold, rain, and penetrating mist that nearly always

prevail, their wages too insignificant to mention, being but a dollar or two for the entire trip, out of which they supply their own provisions and other necessities.

Coca Not Used in the Eastern, Low Lands.—In the village of St. Augustin, at the foot of the eastern slope of the Central Range, again but little evidence of coca using was observed. Only one woman in the market offered it for sale, her supply consisting of but one small bag of the leaves. When we asked an India resident of the mountains near by if he had any coca, he inquired in evident disgust whether we were "momberos," as the coca users are called, the name meaning, "one who uses the mombi, or lime."

In the valley beyond St. Augustin we saw no signs of the use of coca, although we visited the town next beyond on market day, when, if ever, it would have been in evidence. It may therefore be accepted that although coca is not used in the lowlands of either the Eastern or Western Colombian slope, with the mountain Indians, men and women (see Fig. 5) alike, it is an accepted necessity.

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Summary.—Coca-using Indians of Colombia do not *chew* the leaf, but suck the saliva-made juice from the huge boluses of coca leaves mixed with lime, stored in the cheek. So far as known, this has been the method of these people from the traditional past. These coca users are typical specimens of perfect physical manhood, being muscular and well formed. *Whether this is due to the Coca, or is in spite of the Coca*, is a question we did not solve. Their food is simple and sparing, consisting of corn, a little brown sugar, no fruit, no nuts, no fish, little meat, and occasionally beans or rice. Their endurance to both the fatigue of travel and exposure to the elements is phenomenal. From early daylight to the dusk of night they run or walk rapidly. Then, after supper (their first meal since morning), they sleep in a rude "shack" with no other cover than their capes to protect them from the penetrating cold of the damp air and wet ground. The disposition of these Indians is exceptionally pleasant, they being ever genial and good natured. Not one sour, disagreeable, mentally unbalanced or wicked coca-using man or woman did we meet.

During the passage through their country, the only chronic sickness that we observed among them was a severe eye affection, due probably to the smoke of their houses. To our eyes, this smoke was unbearably irritating.—J. T. L.

PERNICIOUS COCA HABIT.

But there is another phase of the Coca subject, historical as well as modern, for in 1835 we find the following description of the pernicious consequences of the Coca habit in Peru, accepted as authentic, by William Hooker:

PERNICIOUS ACTION OF COCA.—To the present day we see the Indian, stretched out unsocially in the shade, alternately putting some Coca leaves and some finely-powdered chalk into his mouth. Silently, as unwilling to be disturbed by conversation, he whiles away a good half-hour in the enjoyment of this occupation, slowly swallowing the saliva and renewing the masticated leaves by fresh ones; and, while thus engaged, not all the haste and impatience of the traveler, nor even the approach of a heavy storm, can rouse the Indian from this state of intolerable apathy. The servant would instantly quit any white master who attempted to restrain him in this respect, and would sooner bear to be deprived of necessary food than to employ, in any other manner, the period allotted to the enjoyment of his Coca.

As the stimulus of the Coca is most fully developed when the body is exhausted with toil, or the mind with conversation, the poor victim then hastens to some retreat in the gloomy native wood, and flinging himself under a tree, remains stretched out there, heedless of night or of storms, unprotected by covering or by fire, unconscious of the floods of rain and of the tremendous winds which sweep the forest; and after yielding himself, for two or three entire days, to the occupation of chewing Coca, returns home to his abode, with trembling limbs and a pallid countenance, the miserable spectacle of unnatural enjoyment. Whoever accidentally meets the *coquero* under such circumstances,

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and by speaking interrupts the effect of this intoxication, is sure to draw upon himself the hatred of the half-maddened creature. The man who is once seized with the passion for this practice, if placed in circumstances which favor its indulgence, is a ruined being. Many instances were related to us in Peru where young people of the best families, by occasional visiting of the forests, have begun to use Coca for the sake of passing the time away; and, acquiring a relish for it, have, from that period, been lost to civilization, and as if seized by some malevolent instinct, refuse to return to their homes, and resisting the entreaties of their friends, who occasionally discover the haunts of these unhappy fugitives, either retire to some more distant solitude, or take the first opportunity of escaping when they have been brought back to the towns. The price of the hydrochlorate of Cocaine, immediately after its anesthetic qualities were discovered by Koller, in 1884, (see page 20), was from \$1 to \$1.25 *per grain*. (See *Eclectic Medical Journal*, 1885, page 501.) The first ounce of this preparation was brought to Cincinnati by the pharmacists, Martin and Heister, Seventh and Elm Streets, who paid for it \$125!

DISCOVERY AND THERAPEUTIC HISTORY OF COCAINE.

Discovery of Cocaine.—Notwithstanding all this evidence, fortified by repeated experiences of travelers, the world of scientific medicine ignored, or even ridiculed, the use of the drug until its introduction in England in the latter part of the last century (about 1870) forced those concerned in authoritative medicine to give it some recognition. Numerous experimentations on its composition had been made, in 1850, by Dr. Weddell and others, who (both before and after that date) tried vainly to discover an energetic constituent of the drug. It was at first believed that the leaves owed their inherent qualities (if they had any, which was questioned) to some volatile principle, a supposition that proved a fallacy, other than in the discovery of the volatile base named by them *hydrine*, which did not at all represent coca, and which is no longer mentioned. However, the persistent reports concerning the beneficial use of coca, and its reputed powers as an empirical substance that was creeping into the use of practicing physicians, led such chemists as Hesse, Niemann, Stanislas, Martin, Maisch, Lossin, Woehler, and many others, to repeated chemical examinations of the drug and its qualities, resulting in a number of products, such as coca-wax, coca-tannic acid, and even of several alkaloidal bases, including one named *cocaine*, this alkaloid being described in 1860 by Niemann, an assistant of Professor Woehler, of Göttingen, Germany. But previously (1855) Gardeke had given the name *erythroxyline* to the crystalline alkaloid he had obtained. Cocaine is not, therefore, a recent discovery.

Remarkable Errors of Physiological Investigators.—Notwithstanding the evidence of the drug's energy on the South American Indians, and the identification, half a century ago, of its now well-known alkaloid, cocaine, coca was long thereafter considered as physiologically inert, or as simply a mild stimu-

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lant, like tea. Its alleged properties were deemed legendary and imaginary, and its alkaloid was regarded as similar to caffeine, both in constitution and qualities, until Koller, in 1884, confounded the professional world, as well as that of science, by announcing the marvelous qualities of cocaine as a local anesthetic. In this connection we may further anticipate by saying that previous investigators of coca had already employed the physiological



Fig. 13.

Original illustration of Coca (Mathews' specimen),
Plate XXI, Hooker's Companion to the
Botanical Magazine, 1836.

method of injecting the alkaloid cocaine into the veins of the lower animals, as well as the utilization of other "scientific" methods of determining its value, such laboratory investigations being accepted as conclusive evidence of the fact that coca, other than as a mild stimulant, like tea or coffee, was *worthless and inert*, and that its alkaloid, cocaine, was similar in effect to caffeine. Physicians using coca were made subjects of ridicule, as being incapable of judging a remedy's qualities; pharmacists making preparations of the drug were tinctured with the odium of being concerned in a fraud, while the natives who employed it in their daily life, as well as travelers impressed by what they had observed of its effects, were regarded as involved in ignorance, or imbued with superstitious imaginings. Into these classes were thrust such men as Poeppig, von Tschudi, Scherzer, Stevenson, Weddell, Spruce, Markham, and others, both scientists and observing travelers, who spoke from personal observation or experience, as well as such balanced commentators as Sir W. J. Hooker, who accepted the energetic action of coca as an established fact. (Fig. 13.) Although other pessimists contributed in the same direction, the most "authoritative investigations" to the discredit of coca appeared in the London *Lancet*, 1876, and in the

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Edinburgh Medical Journal, Vol. XIX, 1873, which may be summarized as follows:

G. F. Dowdeswell, B. A., of London, England, being conversant with the repute of coca and much interested in the subject, determined to establish its position unquestionably, by personal experimentation in a scientific way. With this object, he made a careful study of the record of coca (2) and its reputed action. He took pains to credit by reference those who had previously made reports, describing in detail the processes of the native coca users, and including the experiments of Dr. Alexander Bennett, 1873 (7), in which the physiological action of cocaine on frogs, mice, and rabbits gave no therapeutic promise of individual characteristic other than the suggestion that it paralleled caffeine, theine, and theobromine, the summary (Bennett) being as follows:

When we compare this cocaine with theine, caffeine, and guarana, we find that if it is not identical with these substances, it is intimately related to them in chemical composition; (p. 324).

The investigator had not enough cocaine to give completely its action on temperature and the glandular secretions, but adds that (7), as compared with caffeine, theine, and so forth, "in every other respect cocaine had similar action," thus giving it no quality of its own (7).

Having reviewed the literature on coca (including Bennett's physiological failures with cocaine), Dowdeswell next obtained specimens of the drug, of unquestioned quality. He then interested in his work such authorities as Professor Ringer (who furnished instruments of "perfectly accurate result") and the conspicuous Professor Murrell, of University College. The preparations employed were made by the well-known English chemist, Garrard, referred to by Dowdeswell as follows:

All of which were well prepared by Mr. Garrard, of University College Hospital, who has taken much interest in the subject, and who has also very successfully obtained the alkaloid and the volatile constituent of the leaf, and is still continuing an investigation of its pharmaceutical properties, for which his skillful preparations of other previously unknown alkaloids, as of jaborandi, eminently qualify him.

The preparations made by Garrard were not only such as paralleled the processes of the native users of coca, but also included others, suggested by his own chemical and pharmaceutical knowledge. The experimentation considered, in detail, bodily conditions, rate of pulse, temperature, urine, urea excretion, etc., etc., as influenced by coca. Two detailed tables (2) give the results, which, to the utter disparagement of coca, are summed up by Dowdeswell as follows:

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It has not affected the pupil nor the state of the skin; it has caused neither drowsiness nor sleeplessness; assuredly it has occasioned none of those subjective effects so fervidly described and ascribed to it by others—not the slightest excitement, nor even the feeling of buoyancy and exhilaration which is experienced from mountain air, or a draught of spring water. This examination was commenced in the expectation that the drug would prove important and interesting physiologically, and perhaps valuable as a therapeutical agent. This expectation has been disappointed. Without asserting that it is positively inert, it is concluded from these experiments that its action is so slight as to preclude the idea of its having any value either therapeutically or popularly; and it is the belief of the writer, from observation upon the effect on the pulse, etc., of tea, milk-and-water, and even plain water, hot, tepid, and cold, that such things may, at slightly different temperatures, produce a more decided effect than even large doses of Coca, if taken at about the temperature of the body.

The result of the investigations of these eminent authorities, in connection with the physiological experimentations with cocaine, demonstrated to the world of science that this drug was, at the very best, merely a something in the line of the caffeine-bearing stimulants, such as tea and coffee, and, next, that instead of being of any value whatever, or of possessing any inherent quality whatever, it was positively inert, having (2)

an action so slight as to preclude the idea of its having any value, either therapeutically or popular;

that it has no greater effect on the pulse than

tea, milk-and-water, or even plain water, hot, tepid, and cold;

that it

occasioned none of those subjective effects so fervidly described and ascribed to it by others—not the slightest excitement, nor even the feeling of buoyancy and exhilaration which is experienced from mountain air, or a draught of spring water.

To this may be added that Professor Roberts Bartholow, M. D., accepted that "it acts like theine and caffeine as an indirect nutrient," etc. (*Therapeutic Gazette*, July, 1880, p. 280.)

Just at that time the American "New Remedy Craze" of the 70's was at its height. Among the substances eulogized was coca, which had received a position in the *Prices Current* of all the American manufacturing pharmaceutical establishments, as well as the eulogistic commendations of "country" physicians in American medical prints.

Dr. Squibb Misled.—Paralyzing to such as these were the adverse "authoritative" reports concerning the worthlessness and inertness of the drug (2). All this, together with the variations in the quality of the commercial article (such variations in quality

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being confirmed later by Professor H. H. Rusby, M. D.) (9), very much disturbed the talented, careful, and exceptionally conscientious chemist, the leading American manufacturing pharmacist of that date, Dr. Edward R. Squibb, of Brooklyn, N. Y., who accepted the statements made to the discredit of the practicing physician. In the height of the commercial demand for coca he determined to sacrifice his commercial opportunities to his professional ideals, and to accept the provings of "laboratory physiologists," by excluding all coca preparations from his pharmaceutical list, commending tea and coffee in their stead. He writes as follows in his *Ephemeris* (10), July, 1884:

Almost every purchase (of the crude drug.—L.) has been made on mental protest, and he (Squibb) has been ashamed of every pound of the fluid extract sent out, from the knowledge that it was of poor quality; and there seems to be no more prospect of a supply of a better quality than there was this time last year, because so long as an inferior quality sells in such enormous quantities at good prices, the demands of trade are satisfied.

Under this condition of the markets, the writer has finally decided to give up making a fluid extract of Coca, and has left it off his list, adopting a fluid extract of tea instead, as a superior substitute, for those who may choose to use it, and regrets that this course was not taken a year ago.

"Authorities Are Often in Error or Opposed in Opinion."—Dr. Squibb, however, with even more than his usual carefulness and desire to extend professional courtesy to one and all, perhaps guided also by a latent questioning of the possibility of paralleling the action of a drug in abnormal conditions of the human being by a study of the action of that drug on the lower animals, or even on a man in health, refers to the fact that "authorities are often in error or opposed in opinion," fortifying this statement in the following words:

Conflicting and contradictory testimony from competent authority is not uncommon in therapeutics, and the reasons for it are well recognized in the impossibility of an equality in the conditions and circumstances of the investigations, and hence the general decision commonly reached is upon the principles of averages.

And yet the physiological investigations of Dowdeswell seeming to be incontrovertible, Dr. Squibbs adds as follows:

But there has been no observer on either side whose researches have been anything like so thorough, so extended, or so accurate as those of Mr. Dowdeswell. Indeed, no other account has been met with wherein the modern methods of precision have been applied to the question at all; the other testimony being all rather loose and indefinite, often at second or third hands, or from the narratives of more or less enthusiastic travelers. But if Mr. Dowdeswell's results be accepted as being conclusive, the annual consumption of 40,000,000 pounds of Coca, at a cost of \$10,000,000, promotes this substance to take rank among the large economic blunders of the age.

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Coca Vindicated.—Now came the "irony of fate!" Scarcely had the ink dried in the publication (*Ephemeris*) aforementioned, recording Dr. Squibb's faith in the results of the physiological investigations of Bennett and of Dowdeswell, before it was announced in a letter to Dr. Squibb, dated September 19, 1884, from Dr. Henry D. Noyes, a physician of New York then in Kreuznach, Germany (*Ephemeris*, Nov., 1884, p. 685), that a medical student named Koller, of Vienna, had discovered that a solution of hydrochlorate of cocaine was possessed of marvelous qualities as a local anesthetic.

This letter of Dr. Noyes was immediately given a setting, or reference was made thereto, in every pharmaceutical and medical journal of America. Such an authority as Dr. D. Agnew, of Philadelphia, wrote as follows in the *Medical Record*, October 18, 1884:

We have to-day (Oct. 18, 1884) used the agent in our clinic at the College of Physicians and Surgeons, with most astonishing and satisfactory results. If further use should prove to be equally satisfactory, we will be in possession of an agent for the prevention of suffering in ophthalmic operations of inestimable value.

Came also leading editorials in the various publications on medicine and pharmacy, of which that from the pen of the then editor of the *Druggists' Circular*, Mr. Henry B. Parsons, is typical. From it we quote as follows:

For the past month American medical journals have fairly bristled with reports from various hospital surgeons, and it is pleasing to note that, on the whole, the claims first made for this remedy have been sustained. It seems to be proved that, in the majority of cases, the application to the eye of a few drops of a 2 or 4 per cent solution of this salt will produce a more or less complete, but transient, insensibility to pain, with enlargement of the pupil. Operations upon the conjunctiva and cornea ordinarily requiring the use of chloroform or ether have been performed upon patients conscious of everything being done, but saved from pain by the application of a weak aqueous solution of this salt. In several operations for removal of hard cataract, the patients complained of no pain whatever, the entire conjunctival surface being insensible to repeated pinchings with the surgeon's forceps. The only sensation described was that of "numbness and hardness." After a time the eye returns to its normal sensitiveness, and there seems to be no troublesome local after-effects.

Let it be observed that in the beginning cocaine was commended in operations on the cornea of the eye, its latest application in minor operations in surgery, dentistry, and elsewhere being at that time not even a theoretical possibility.

Lofty Methods of Dr. Squibb.—Accepting the facts of the present, Dr. Squibb now threw all his efforts into a new investigation of coca and its now famous alkaloid, his process of manufacture being yet a standard, and his writings on cocaine being yet authority. These need but be referred to as occupying many pages in the *Ephemeris*, 1884-5. They stand as a lasting memorial to the lofty methods of this exceptionally fair man, who took pleasure in

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publicly correcting an error, and whose every record in American pharmacy is monumental.

The discovery of the anesthetic qualities of coca marked the beginning of an epoch in medication whose story, in connection with the past, pleads irresistibly for tolerance of thought and action toward men who *know that which they know* by reason of *personal experience* and the art of empirical observation. Perhaps in no other instance has the almost hopeless cry for recognition of the facts developed by empiricism been more prominently illustrated than by the struggle of this drug. One of the greatest blessings to humanity when properly used, coca was for nearly three centuries neglected by men of science and subjugated by professional prejudices. At last the eminent botanist and pharmacologist, Henry H. Rusby, M. D., was led to undertake a journey to South America in behalf of science, coca being a dominant factor, and for that enterprise the great pharmaceutical house of Parke, Davis & Co., of Detroit, concerned in the expedition, deserves great credit. The result of Dr. Rusby's study is presented in the *Therapeutic Gazette*, 1886, pp. 14-18, and 1888, pp. 158-303, and it may be added that this exceptionally valuable treatise is at this date not less important than when Dr. Rusby contributed it.

Needless is it to do more than refer to the marvelous reaction that followed Koller's discovery of the power of cocaine as a local anesthetic. A library would be required to shelve the works devoted, eulogistically, to the new discovery. A volume would scarcely print the names of the enthusiastic converts to cocaine, formerly so discredited.

The Foreseeing Poet.—Let us now do tardy justice to the prophetic words of the seer-like poet, who so often foresees that which others either neglect or do not appreciate. The poet Cowley, 1618-1667, in his *Book of Plants*, published in 1662, not only mentions coca, but sets forth that marvelous drug in terms that, neglected and discredited for nearly three centuries, need to-day no apology.

Strange, is it not, that nearly three hundred years ago the vision of a poet familiar with wine and opium should discredit in their own home these popular stimulants in favor of the qualities of a leaf established only in a foreign land, and known to him only through the tales of travelers? Read how artfully he introduces the familiar deities of old, how "the gods shout with laughter" at the unpretentious South American intruder, and how, in the ending of the passage, he predicts the bringing from "the dreadful Andes, the frightful land situated among the clouds, the home of winds and rain and winter storm," the merchant's load of leaves, "a pleasing commerce to the wretched world." (II.)

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Eulogy of Coca.

From the Latin, by Margaret Stewart, M. A.

From Cowley's Book of Plants,* V: 783-838.

The vine departs; and all the deities of the old world applaud, and with purpled hands seize the clusters. Bacchus, in jesting mood, brings a generous cup of wine, pressed from many grapes, to thee, Omelochilus. "Come, drink, comrade," he said. "If thou dost taste this wine, no other of the gods will be more fit than thou to tempt the crude appetites of the cannibals."

And Omelochilus, not accustomed to the acid Grecian wine, drinking it, rages in frantic wrath, and would doubtless repay the jest with blows, but fears the well-known strength and courage of the European deity. Therefore (to be quits with his tormentor.—S.) he bids the fruits advance to strife less cruel. They all stand forth in beautiful array, displaying their various products, and like Amazons they advance, with pictured armor.

First in line, dishonored from lack of fruit,† stands Coca, a little tree, gleaming with slender stem. And Venus scoffs. "Truly, the race of American husbandmen have chosen with little judgment, coming into a contest as regards fertility with a dwarf eunuch as their leader." The gods shout with laughter. But Mother Pachamama rebukes the bold goddess, and defends her loved Coca. "How greatly dost thou err, Cytherea! Truly, the lustful fertility of lovers is alone known to thee. Here, thou art a bad judge. My realms, lacking sex, are an unknown country to thee. Beyond all others, everywhere, the land is fertile. This tree at which you scoff is perennially fertile, and ever swells with unnumbered fruits. Do you still laugh? See how full of leaves it is! In every leaf it bears a fruit. Nor will these leaves yield in usefulness to any fruits from any tree. These, by the wonderful gift of Pacchamacus Virococha (who was moved to pity by the coming hardships of the land, reduced to poverty because of its too great wealth), remaining for a time in the mouth, the juice trickling thence continuously to the stomach, restore the weak, made languid by long continued hunger and lengthened toil, and give back vigor to the limbs and strength to the weak body, tottering under its burden, in a manner such as you, Bacchus and Ceres, deities both, could never do. The Quitoita, carrying three of these as supplies for their journey, will sometimes endure for twice three days, and feasting abundantly upon these, will traverse the dreadful Andes, a frightful land, situated among the highest clouds, the home of winds and rain and winter storm, and likewise thine, brave Coca, whom the warlike goddess Venus derides as an insignificant leader. Nor shalt thou be less esteemed for thy admirable qualities, illustrious Coca, than for thy services to mankind. The merchant fears not to seek thee here, to bear thee hence. Yearly he loads the groaning Vicugni and Paci in countless numbers with thy leaves, bringing a pleasing commerce to the wretched world."

Thus speaks the mother Pachamama, her skin painted with numberless figures, and with a nod she bids Hovia to advance, Hovia, bearing fruits stony and despised, but ranking next in value (to those of Coca.—S.) though of different kind.

*In this portion of the poem Cowley describes a feast of the gods, including the deities of both the New and the Old Worlds. Venus presides, and Bacchus offers wine to Omelochilus, a South American deity. Pachamama (the "skin mother") is a leading deity of the Incas. The "Quitoita," "Vicugni," and "Paci" are tribes of Indians now obscurely known. The translation is in most cases strictly literal, but in a few lines the sense requires a somewhat free rendering. Several editions of Cowley's "Sex Libri Plantarum" are on the shelves of the Lloyd Library. The one from which the translation is made was printed in London, 1678.—S.

†The shrub coca bears a creamy white flower, and a berry somewhat like a small cranberry, red when immature, but darkening to nearly black. Of this Cowley was evidently unaware.—S.

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Erythroxyton Coca in Eclecticism.

The Eclectic study of Coca, from the beginning, has been altogether in the direction of its therapy, being confined mainly to the drug and its preparations. The principle of the Eclectic school of medicine has ever been that of antagonism against all habit-forming drugs, such substances as opium, morphine, and chloral being almost debarred from use by reason of their untoward action when the patient becomes addicted thereto. The Eclectic physicians were thus led to the most cautious methods with Coca, even at the very start. In this they were probably influenced by the experiences of travelers in the land of Coca, for the Eclectic physician places much dependence upon *statements of fact*, from whatever sources derived, and aims to profit by the experiences of others, regardless of their life station. The term empiricist has, for the true Eclectic, no terrors. Having ample authority regarding the domineering action of Coca as a habit-breeding drug, from the testimony of the most talented observers, they could foresee disaster were this Coca habit transplanted to America.

As concerns its alkaloid, Cocaine, it may be also said that although Eclectic physicians utilize it cautiously and discreetly, little enthusiasm in its employment has been exhibited, other than as a local application in minor surgery, such as dentistry and superficial minor operations. Thus we quote from Webster's *Dynamical Therapeutics*, the edition published even as late as 1898, as follows:

The continued use of this drug in conjunctival and corneal diseases is positively injurious. In these diseases, though it gives temporary relief from the annoying symptoms, its use is followed by increased inflammatory action. Ulceration of the cornea may follow the continued use of the drug.

Cocaine is a drug that I do not consider safe to give the patient to use, as it may be carried too far. I have had several cases of this kind. Opacities of the cornea have been reported as resulting from the use of cocaine, but I have never seen a case that could positively be traced to its use.

In this connection, the same author refers to the use of Cocaine in the ear, as follows:

A four per cent solution of this drug has been forced through the Eustachian tube into the tympanum for the relief of tinnitus, and with reported good results. This procedure I consider dangerous for two reasons: Cocaine poisoning has resulted from the use of the drug in this way, and I do not consider it safe practice to force fluids into the ear through the Eustachian tube.

Although Cocaine is discreetly employed by Eclectic physicians, and cautiously commended by Eclectic authors, every effort has been made to avoid introducing to the patient a substance that may prove to be a subsequent curse, a method of procedure that we take it will not at this date be harshly criticised by even the severest opponents of this minority school of medicine.

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In this connection it may be stated that the internal use of this alkaloid (Cocaine) by the Eclectic school is by common consent almost prohibited, and although Professor Felter, in the *American Dispensatory*, necessarily gives the full action of Cocaine in ophthalmic surgery, painful and superficial minor surgery, dentistry, etc., he emphasizes the danger of its use internally, in the direction where it seems to have been most highly commended, as follows:

The action of cocaine in confirmed mental disorders is deleterious, and it has failed to become a remedy for neurasthenia, melancholia, etc., as it was once hoped would prove to be the case. Were it not for the fact that almost toxic doses are required, it would be of value in such gastric disorders as neuralgia, ulceration, or carcinoma of that organ. As a remedy in the treatment of alcoholism and of the opium habit it has nothing to commend it, as a cocaine habit, as pernicious as those it is sought to cure, is extremely liable to become established.—*Amer. Disp.*

Closing the five-page article on Cocaine Hydrochlorate and its allied preparations in the *American Dispensatory*, we find only a two-line commendation, as follows:

Specific Indications and Uses.—To produce local anæsthesia upon painful parts, or to facilitate examinations and minor operations upon sensitive tissues.

In this same connection, reference may be made to the ignoring of Cocaine by the late talented oculist, Kent O. Foltz, M. D.,* who barely mentions the drug in his *Diseases of the Eye*, although he gives conspicuous attention to other remedies, such as Jaborandi.

The pages of the *Eclectic Medical Journal*, from the time of the discovery of Cocaine, have faithfully carried the record of the drug, as established by those who believed in its use, but yet continual emphasis is laid upon the fact that its indiscriminate use must lead to professional as well as general abuse, little being said in behalf of its employment other than cautiously, as a local anesthetic, in the hands of an experienced practitioner. No Eclectic compound for general use of the profession carries any Cocaine whatever.

But in contrast with the Eclectic neglect of Cocaine alkaloid and allied substances, we find pharmaceutical preparations of the drug Coca conservatively employed as components of prescriptions, where, in exceedingly small amounts, in localized internal directions, it is frequently of service. So far as we are aware, no example has ever been recorded of a Coca habit resulting therefrom.

In the early editions of *Specific Medication*, Dr. John M. Scudder entirely neglected Coca and its preparations, not even mentioning

*"Diseases of the Eye." A Hand-book of Ophthalmic Practice, by Kent O. Foltz, M. D. 12mo. 566 pp. (John K. Scudder. Price, cloth, \$2.50.)

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the drug by name, but finally, in the tenth edition (published in 1903), Coca was introduced with the following comment:

Coca is a stimulant to the nerve centers, and at the same time diminishes waste. It allays hunger, and enables the person to endure great fatigue. The excretions are all diminished whilst the person is under its influence.

It may prove useful in the early stages of tuberculosis, by enabling the person to take the exercise so much needed to burn the imperfect materials in the blood.

In 1881 Dr. Scudder reported as follows his opinion of Coca, based on its clinical use in his practice:

For some months I have been using this remedy in a class of cases where there was defective innervation, some dyspepsia (imperfect digestion, though the appetite was good), pain in the occiput and neck, with dizziness, and inability to stand for any length of time.

In three of these cases, where the most marked benefit was experienced, the disease had been diagnosed "dumb ague," and treated with quinine to the extent of lessening (stopping in one case) the afternoon feverishness, but leaving the unpleasant symptoms named above.

In one case the patient had been a sufferer from rheumatism for a year or more, had ovarian irritation with scanty menstruation, functional heart disease, and inability to digest the ordinary food used by the family. Anti-rheumatics had removed the pains, the heart-beat had come down from 110 to 70, and the irregularity of pulse had disappeared. She had gained flesh, but had no strength, and was nervous and despondent. The food was changed to a very plain diet in moderation, and the coca given in fifteen drop doses every four hours with the most marked benefit.

A business man had suffered from overwork, some worry, good living, and want of exercise, and now found himself with some dyspeptic symptoms, pain in the occiput, and dizziness. A spare diet was recommended, all stimulants to be avoided, open-air exercise to be taken, and ten drops of coca every three hours. He improved steadily and was himself again in the course of a month. Was it the coca? Or was it the diet, avoidance of stimulants, and the open-air exercise? The reader may answer these questions for himself. I think both had something to do with the cure, but I am sure that without the diet and exercise he could not have recovered. I do not think it well to make a hobby of Erythroxylon coca, or of any other remedy, but it may be remembered as a very good nerve stimulant in the cases I have named.—*Scudder*, E. M. J., 1881, p. 528.

In the revision and enlargement of "Specific Diagnosis and Medication" by Fyfe, 1909,* we find equal care, as exhibited in the following, which comprises all that is recorded concerning the therapeutic uses of Coca:

Coca is a useful remedy in many cases of neurasthenia, and in cases where exhausting mental work has resulted in morbid depression of spirits it promptly exerts a beneficial influence. In despondency, as well as in nervous irritability, it constitutes a medicament of corrective power.

Indications.—Mental or physical exhaustion; gastro-enteric debility; enfeebled conditions of the nerve centers; difficult breathing due to functional diseases of the heart; hysteria: states of depression, with a feeling of weariness.

*"Specific Diagnosis and Specific Medication." By John W. Fyfe, M. D. An entirely new work, based upon the writings of Prof. John M. Scudder, M. D., with extensive extracts from other Eclectic authors. 8vo, 792 pages. Cloth, \$5; law sheep, \$6.

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The foregoing brief remarks and comments indicate that although Coca is discreetly valued in the Eclectic school, its use is subject to professional care, every effort being made to avoid the reckless introduction to the people of either the drug itself or its alkaloid. The employment of Cocaine, as taught by the Eclectic leaders, is included with Opium, Chloral, and like baneful agents, the following sentences, admirably summing up the subject as applied to opium (the same being true of Cocaine), by Dr. E. R. Waterhouse, being abstracted from Lloyd Brothers' Treatise on Opium:*

The thinking physician acquainted with remedies and indications can easily substitute more harmless remedies for the opiates so often used, and by so doing will serve his patient better than with the latter.

Let us be sure of our indications, and above all let us see to it that we do not leave our patients in a worse condition than when we found them, which will be the case if, through our agency, a drug habit, such as the terrible slavery to opium, is produced in any individual.

With a view to making a detailed and complete record of the drug in this publication, the uses of Specific Medicine Coca, in directions where it is employed by Eclectic physicians, and where, as has been said, no record is extant of any patient having contracted any Coca habit from its use, has been prepared for this Treatise by Professor Finley Ellingwood, M. D., of Chicago, (pages 27-30), which may be accepted as the careful summing up of its uses by one experienced both as concerns the literature on Coca, and in its professional use, through clinical experience of long duration.

ECLECTIC USES OF ERYTHROXYLON COCA.

By Finley Ellingwood, M. D., Chicago, Ill.†

General Uses and Action.—So striking are the general indications and actions of Coca as to have dominated the attention of observers, and thus largely prevented the determination of its definite specific action on exact conditions. As a specific medicinal remedy, therefore, Coca has not been studied with the close observation and reference to exact application that its merits demand.

*"Drug Treatise No. XXII." A Treatise on Opium and Its Compounds, Diaphoretic Powder, Sudorific Tincture, Mild Zinc Ointment, Ophthalmic Balsam, and the Eclectic Substitutes for Opium.

The Eclectic Substitutes for Opium and Their Uses are by E. R. Waterhouse, M. D., St. Louis, Missouri.

The Therapeutic Uses of Diaphoretic Powder, Sudorific Tincture, Mild Zinc Ointment, and Ophthalmic Balsam are by H. W. Felter, M. D., from the American Dispensatory.

The Illustrations are from photographs taken in Asia Minor by Mr. and Mrs. John Uri Lloyd.

Special data concerning Opium in its Oriental home are properly credited to Professor Thomas H. Norton, the American Consul in Smyrna; Mr. Alfred A. Keun and Mr. Agop Alpiar, Smyrna, Turkey.

The Description, Chemistry, Pharmacy, and History of all the substances named are by John Uri Lloyd.

†Editor "Ellingwood's Therapeutist," a monthly journal of therapy and descriptive materia medica; author of "Ellingwood's Practice of Medicine," "Ellingwood's Materia Medica and Therapeutics," "Normal Pregnancy," etc.

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In its general influence, Coca covers a very wide field. Not only is it a nerve stimulant, whose influence begins with the brain, but its effect on the cerebrum and thence on the entire nervous system, including the heart, are plainly marked. Coca thus becomes a circulatory stimulant, and for this reason it acts as a respiratory stimulant. Lastly, but not least, it is also a powerful muscular stimulant, its action in these various fields seeming to be so plainly marked that in each direction it may almost be said to act independently. Yet without doubt a definite, connected influence is exerted in all these fields.

The stimulant action of Coca is easily overdone, with a resultant paralysis, local anesthesia and convulsions, with general depression, ataxic gait, and uncertain muscular action and pronounced insomnia, difficult, in some cases, to overcome.

Because of this liability to overstimulation, Coca must be given in carefully adjusted doses, always small, never large enough to produce pronounced physiological effects.* Thus administered, the remedy is of benefit in hysteria and in melancholia, seeming to affect these conditions directly, while at the same time, if proper auxiliary measures be adopted, it overcomes the basic neurasthenia upon which such conditions depend.

As a Restorative of Strength.—While originally thought to produce permanent restoration of strength, as shown by the native use of the leaves (see pages 5 to 14), the conclusion is forced upon us that the conditions governing the therapeutic use of Coca as a nutrient have not been fully established, since it does not promote functional operation in the various organs sufficiently to permanently increase nutrition, at least to any great extent. Under certain circumstances, its influence in this direction is apparent, but as a specific remedy for this purpose Coca alone can by no means be depended upon.

As an Aphrodisiac.—While aphrodisiac action is attributed to Coca, this being said to be occasionally plainly apparent in its native habitat, Coca has not shown sufficient activity in this line to encourage the belief that it can be relied upon for that purpose.

As a Tonic.—Its influence as a tonic to muscular structures, and its immediate stimulant influence on muscular action, are probably exercised through its influence on both the nervous system and the muscular structures themselves.

Through some peculiar influence not yet understood, Coca increases the powers of endurance, and induces a singular immunity to the suffering incident to privation and excessive physical action, that can not be ascribed altogether to its anesthetic influence. It

*In this connection we call attention to the axiom of Professor Scudder, as follows: "It will never do to suppress the process of disease at the risk of suppressing the organism upon which natural function depends."

COCA, "THE DIVINE PLANT OF THE INCAS."

is natural to suppose that there would be a detrimental reaction following this influence, but by those who use the leaves a claim is made of permanent invigorating and restorative effects, which are not yet understood.* It has been argued that Coca probably abolishes hunger because of its local anesthetic influence on the nerves of the stomach.

Following the suggestions of its restorative influence, if given wherever there be debility of the heart's action and cardiac weakness, the stimulating action of Coca is satisfactory, its subsequent effects being those of a nerve tonic. Given in medicinal doses, it improves the digestion and the condition of the nervous system, and overcomes mental exhaustion, which is often accompanied with depression of spirits and despondency. It relieves nervous irritability, restoring the capacity for work, inducing renewed energy in those who have been overwrought.

Insomnia and Nerve Exhaustion.—In cases of violent and immediate exhaustion or prostration, which are sometimes accompanied with extreme insomnia, not allayed but rather increased by sedatives, I have used a combination of a few drops of Specific Medicine Coca and ten or fifteen drops of the tincture of Red Cinchona, from one-tenth to one drop of Specific Medicine Capsicum, and a tablespoonful of port wine, or other immediate stimulant to each dose. Dose, teaspoonful every hour or two. The amount of Coca in this prescription is determined according to the debility exhibited, the remedy being given for its immediate bracing influence.

As a stimulant I have yet to find the equal of the above prescription, nor have I any record of a Coca habit resulting therefrom. After the second dose the patient becomes quiet, and at night falls into a normal sleep that often continues for six or eight hours, sometimes unbroken; at other times the patient waking naturally after two or three hours, and shortly again falling asleep, with no undesirable effects upon awakening. The use of the remedy must be abandoned when the patient becomes normal.

For Indigestion.—Painful conditions of the stomach resulting from indigestion are better relieved by small doses of Specific Medicine Coca than by other remedies. The action of the drug here is difficult to explain. It certainly causes an increase of the gastric and intestinal juices, and imparts a temporary tone to the stomach, which becomes more apparent with the use of properly added remedies. In conditions of flatulency or colic, or various acute painful disorders of the gastro-intestinal tract, Specific Medicine Coca is very useful.

Coca thus facilitates digestion, improving the general tone of

*See pages 5 to 14, where J. T. Lloyd describes its uses by the Indians in the Colombian Andes.—Ed.

COCA, "THE DIVINE PLANT OF THE INCAS."

the patient in neurasthenia, in which indigestion is due to a lack of nerve force. Whenever dyspepsia is dependent upon extreme atonicity and a lack of power in the digestive organs, Coca should be beneficial. Where nausea and vomiting result from feebleness and decomposed food, if the stomach be first evacuated, the condition will cease and the powers of the stomach be restored, with small doses of Coca alone. It is also beneficial in reflex vomiting, but it is seldom this condition is present without lack of tone.

Headache.—Headaches due to enfeebled conditions of the stomach and digestion, or to fermentation of food, will cease on the taking of Specific Medicine Coca with a little Specific Medicine Capsicum, as per preceding prescription under "Insomnia and Nerve Exhaustion." These remedies, combined, exercise both a local and a general stimulant influence.

In Exhaustion After Fever.—In line with the action of Coca in extreme acute exhaustion, the aforementioned combination of Specific Medicines Coca and Cinchona will, as a rule, be found surprisingly useful after the prostrating effects of continued fevers, or during shock from any cause, especially surgical shock. In certain cases during pregnancy the spinal cord becomes irritated, and the nerve force is drawn upon for the child, until the mother is threatened with puerperal mania. Here no combination is more satisfactory than the foregoing. (See prescription under "Insomnia and Nerve Exhaustion.")

In Migraine.—In migraine, where the difficulty is due to exhaustion, either physical or mental, Coca will be found valuable. In other headaches—those of wasting nervous diseases—where the phosphates are found very abundant in the urine, and usually in occipital headaches, with great pain in the back of the neck and resultant weakness, the influence of Coca is favorable, if properly administered. In this affection (Migraine), Subculoyd Lobelia, given hypodermically, is very prompt and should always be at the command of the physician. (See "Summer Remedies," Lloyd Brothers, 1913.)

Specific Use.—So far as our observations have taught us, Coca is specifically indicated for its immediate effect in acute exhaustion, sudden shock, or prostration. It should be given in fatigue from any cause, overwork, general weakness, and disinclination to muscular action; also in feeble heart, where the fault is from exhaustion, rather than from actual disorder, with difficult breathing and some palpitation, or where there are faults of digestion, either intestinal or gastric, with resultant headache; also in headache from feebleness, especially from the peculiar headache of nervous exhaustion, to which we have elsewhere referred.

Be sure that the use of this or any other prescription of Coca is not carried to the habit-forming period. In chronic conditions,

COCA, "THE DIVINE PLANT OF THE INCAS."

let there be occasional changes in medication. Do not inform the patient concerning the nature of the remedy employed. Better resort to other agents, of which physicians familiar with the Specific Medicines are aware, than to establish in an individual a curse greater than the original disease.

In this article, all references to the therapy of Coca are understood to refer to the use of the Specific Medicine, which is a pharmaceutical preparation of Coca leaves, no reference whatever being herein made to the action, medicinal or otherwise, of *Cocaine*, which, although a local anesthetic, is also an active remedy in many lines, but so different from those of Specific Medicine Coca as to make it necessary to consider the two remedies separately.

PHARMACEUTICAL PREPARATIONS OF COCA.

In the beginning of the therapeutic use of Coca by the medical profession of America, as mentioned in the preceding pages, Coca was employed principally in the form of fluid extracts. Its reputation and use by physicians soon led home-cure dispensers of therapeutic products to include more or less of the drug in the composition of their preparations, and to employ the name "Coca" extensively in literature distributed by them to the public. Fluid Extract of Coca first became official in the Pharmacopeia of the United States, 1880; but no other pharmaceutical form of Coca other than the wine of Coca, 1900, and Eclectic Specific Medicine was presented to the profession until after the anesthetic qualities of the alkaloid *Cocaine*, were discovered. Immediately thereafter the eyes of the medical as well as the chemical profession were centered upon this one product of the drug, and within a very brief period the fact that Coca contained other than this one constituent was lost to sight. Wedging itself into immediate conspicuity, and dominating the fields of Coca activity (excepting in the Eclectic and Homeopathic ranks), Cocaine soon became master of the situation in both the medical and pharmaceutical professions, and by this combined authoritative introduction in a remarkably short period it became familiar to the people also. Even that greatest of the world's stimulants, coffee, presents in its conquering march no parallel to the rapidity with which Cocaine moved, as it became the chief of the master habit-forming drugs. Bidding fair to supplant even morphine in its dominating harmful influence, Cocaine soon became a "dope" tyrant, prostituting a great portion of the American people, a result that is seemingly not possible with the natural pharmaceutical preparations of the drug.

Cautiously, physicians using Specific Medicine Coca introduced this preparation into their practice. Carefully did they study its uses, finally employing it, as shown in Dr. Ellingwood's paper,

COCA, "THE DIVINE PLANT OF THE INCAS."

pages 27 to 30, where the drug was specifically indicated. Only when directly indicated was it given, and then only in such small dosage or so compounded, as never to lead to any Coca habit, whilst the fact that it was dispensed in prescription form only, prevented the name of the drug from being brought to the attention of the patient or the public. Hence it is that there is no record of any Coca habit established by the use of the preparation named, which has the qualities indicated by the following label, each minim of the medicine representing a grain of the desirable constituents of Coca leaves, determined in accordance with the clinical experience of those who united in establishing the remedy.

COCA.

(Erythroxylon Coca.)

Specific Use.—Stimulant to the nerve centers, diminishing the excretions, allaying hunger, and giving artificial strength and endurance. Used in debilitated conditions; in hysteria; mental or physical exhaustion; gastro-enteric debility; and in enfeebled conditions of the nerve centers.

Dose.—℞. Sp. Med. Coca, ʒj; water, ℥iv. Misce. Sig. A teaspoonful every hour or two.

Sp. Med. Coca is a remedy for deficient innervation, shown by defective digestion, even though the appetite remains, especially when accompanied by pain at the base of the brain, vertigo, and inability to stand for any length of time. It increases the flow of the stomach juices, imparts tone to the organ, and controls gastric pain. It is in weakness of the stomach and nervous system that it finds its greatest use. It prevents fatigue and enables one to prolong muscular efforts. For this it is valuable in convalescence, and particularly so in phthisis, to enable the patient to be about in the air as long as possible. It allays thirst and hunger, and for this purpose has been used in diabetes and insanity. It exerts a restraining effect in wasting diseases and is valuable in the debility following acute diseases. Coca is useful in irritative or atonic dyspepsia, colic, flatulence, gastralgia, enteralgia, spinal irritation, hypochondria and nervous erethism. Asthma has been slowly but permanently cured with it, and it often relieves migraine or nervous headache.

CHARACTERISTICS OF SPECIFIC MEDICINE COCA.

Specific Medicine Coca has a deep green color and a pronounced herby odor. Its taste is characteristic of the chewed leaves, leaving on the tongue only a slight, benumbing sensation, this in consequence of the masking influence of the tannin, chlorophyl, volatile and fixed oils, and other substances associated with Cocaine, in the natural leaf. With water, it makes a greenish, opalescent mixture, due to the above named structures, consequently aqueous prescriptions of the Specific Medicine should be shaken before each dose is taken. When assayed by the Lloyd Reagent process, 0.5% (about) of amorphous alkaloid results. This alkaloid is, however, but one factor in the therapeutic structure of Specific Medicine Coca, which is established for its therapeutic qualities, not its physiological action.

	¼ D.	½ D.	1 D.
Prices of Specific Medicine Coca	\$0 75	\$1 40	\$2 75

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A TREATISE ON PULSATILLA.

Therapy of Pulsatilla.—Rolla L. Thomas, M.D.

Description of the Herb.—From the Pharmacopeia of the United States.

Common Names, Botanical History and Synonyms; Medical History.
From "Drugs and Medicines of North America." J. U. and C. G. Lloyd.

Physiological Action.—Dr. Finley Ellingwood, "New American Materia Medica, Therapeutics and Pharmacognosy."

Therapeutic Uses.—Writings of Dr. E. M. Hale, Dr. John M. Scudder, Dr. Chauncey D. Palmer, Dr. Thomas S. Blair, Dr. John Wm. Fyfe, Dr. Harvey Wickes Felter, Dr. Geo. W. Boskowitz, Dr. Joseph S. Niederkorn, Dr. Finley Ellingwood, Dr. William Nelson Mundy, Dr. James D. McCann, Dr. Ford Scudder, Dr. Albert F. Stephens, Dr. Benj. L. Simmons, Dr. J. C. Ellis, Dr. Lyman Watkins, Dr. J. P. Harvill, and Dr. A. J. Smith.

Characteristics, Constituents, Chemistry, and Pharmaceutical Preparations.—By John Uri Lloyd.

MATERIA MEDICA STUDIES.

The accompanying treatise is part of a series that, when completed, will give physicians preserving same, a convenient fund of comprehensive and useful information concerning the subjects embodied therein. The fascicles appear at intervals, each being complete in itself, and will be mailed, with our compliments, to physicians desiring them. We are led to this work by the many and increasing requests we receive from physicians who either wish to review the qualities of old remedies, or to study new ones. The fascicles consequently embrace both new and old drugs, the aim being to present those concerning which, as manufacturers of representative pharmaceutical preparations, we are continually solicited for information. They carry such related phases of Materia Medica, history, description, therapy, etc., as are necessary to a comprehensive view of each drug, its therapy, and its best preparations.

DRUG TREATISE, NUMBER XXVIII.

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THERAPY OF Specific Medicine Pulsatilla.

By PROFESSOR R. L. THOMAS, M.D.

Pulsatilla, which has been official in the U. S. Pharmacopeia for several revisions, is a remedy of great value.

Its influence upon the cerebro-spinal and sympathetic systems makes it a remedy that will be found most useful in many conditions depending upon a disturbance of their functions. It is a favorite agent in lesions of the reproductive organs, in both male and female, when due to nervous derangement.

In amenorrhoea, when not due to malpositions or anaemia, but the result of atony or nervous shock, its administration will give the most happy results. In dysmenorrhoea, due to defective innervation, it enhances the efficiency of gelsemium, macrotys or viburnum. In spermatorrhoea and prostatorrhoea, many times the mental disturbance prolongs, and sometimes prevents a cure; in such cases Pulsatilla clears the way for recovery by clearing the mental vision.

During the pregnant term, it is often of great benefit in relieving the forebodings so often present, as well as the many nervous derangements so common to this condition.

In hysteria, where the patient is weak, depressed, cries readily, is despondent, morose, is fearful of the future, and has an indefinable fear, there is no better remedy.

In **functional** heart lesions, attended by the fear of a fatal termination, causing the patient to become restless or despondent, and where insomnia results, Pulsatilla can be relied upon for relief. Organic cardiac lesions attended by nervous derangements will be benefited, though a cure is not to be promised. **Functional disturbances of any** organ, attended by a soft, weak pulse and mental disquiet, will be benefited by the use of this most valuable agent.

Indications.—Soft, easily compressed pulse, dark lines under the eyes, **depression** of the nervous system as shown by an indefinable fear of impending danger.

Dose.

Spec. Med. Pulsatilla, Gtts X to 3ss.
Aqua Dest. 3iv.

Misce.

Sig.—A teaspoonful of the dilution every one, two or three hours.

PULSATILLA.

"The herb of *Anemone pulsatilla* and *Anemone pratensis* Linné, and of *Anemone patens* Linné, var. *Nuttalliana* Gray (Nat. Ord., *Ranunculaceae*), collected soon after flowering.

"It should be carefully preserved and not be kept longer than one year."
—U. S. P., 1880.

"The herb of *Anemone pulsatilla* and of *Anemone pratensis* Linné (nat. ord. *Ranunculaceae*), collected soon after flowering.

"It should be carefully preserved, and not kept longer than one year."
—U. S. P., 1890.

Pulsatilla not included in the Pharmacopeia of 1900.

COMMON NAMES.—In botanical works the plant is known as *Pasque-flower*, so called from the European species, which flowers about Easter. It is also known as *May-flower*.*

The botanical relationship of the *pulsatilla* herbs, including those native to America, have long been the subject of research and discussion by systematic botanists. The following synopsis, by C. G. Lloyd, from *DRUGS AND MEDICINES OF NORTH AMERICA*, 1884, relates to the American species and varieties: Botanical literature as well as prints illustrating early spring flowers give "*May-flowers*" marked attention.

"BOTANICAL HISTORY AND SYNONYMS.—The plant was first described as *Clematis hirsutissima*, by Pursh (1814), from a specimen collected by Lewis and Clark while on their Western expedition. Nuttall, in 1818, transferred it to the genus *Anemone*, where it properly belongs, and named it *Anemone ludoviciana*, which name was changed by De Candolle, shortly afterwards, to *Anemone Nuttalliana*. The plant belongs to the section *Pulsatilla* of the genus *Anemone*, distinguished by having the achenes prolonged into hairy tails; and by many botanists this is considered a distinct genus. Sprengel adopted this view of the subject, and called the plant *Pulsatilla Nuttalliana* (1825).

"*Anemone patens* (the typical species) is found in Siberia, and was discovered in British America by Hooker, and included in his *Flora Boreali-Americana*. For some years the variety (*Nuttalliana*) was not distinguished from the plant collected by Hooker, and was accordingly called *Anemone patens* in Torrey and Gray's *Flora*, and *Pulsatilla patens* in Gray's *Genera*. It is only in late years that the plant has been recognized as a distinct variety, and it was named *Anemone patens* var. *Nuttalliana*, by Gray, in his *Manual*, fifth edition (1867)."

CHARACTERISTICS.—All the *pulsatilla* species and varieties are, when green, acrid and irritating. The fresh juice inflames the eyes, and even closes them temporarily. Many persons are severely irritated simply from contact with the recent plant. The exhalations from the plant, whilst being dried in quantity, inflame the eyes of manipulators, and with some persons excite violent coughing. The alcoholic tincture of *pulsatilla*, whether made from the green or the dried drug, seems to carry its therapeutic value, without the irritating qualities of the juice. Possibly the alcohol overcomes its acrid influence, without disturbing its therapeutic action. The aged, dried drug excites tingling of the tongue, but is not as violently irritating as is the juice of the green herb.

**Drugs and Medicines of North America*, J. U. & C. G. Lloyd, 1884.

MEDICAL HISTORY.—(From *Drugs and Medicines of North America*, 1884).—"The European pulsatillas have been used in medicine from very early times. Galen, Dioscorides, and others, have written about the different species of Anemone, but it seems to have been reserved for Baron Störck to have revived and permanently established the application of pulsatilla."*

The medical history of pulsatilla would require a volume, and the reader is referred to the multitude of works on that subject in the Lloyd Library.

CONSTITUENTS.—Possibly no class of plants of energetic natures when fresh, are more susceptible to changes than the anemones, including pulsatilla. Beginning with Störck, 1771, (See Footnote,*), a substance called "anemony camphor, or pulsatilla camphor or anemoneum,"** has been recorded. This, as well as other pulsatilla complexities and educts, has been studied by many chemists, beginning with Heyer, 1779. The principal decomposition constituent, named anemonin (See Footnote), is obtained from water distilled from the plant, and is in the form of crystals. These soften at 15°C., and decompose at a higher temperature, a pungent vapor escaping, and charcoal remaining. (Fehling).

Different investigators have given varying characteristics to the different materials produced under the name anemonin. If this has a natural setting in the drug, its structural position is unknown, which is likewise probably true of all the by-products and decomposition materials, fixed and volatile, that have been evolved from pulsatilla by means of heroic chemistry.

In our opinion, the therapeutic value of pulsatilla depends upon the drug texture itself, or its adsorbed alcoholic representative. The discordant results obtained by chemists are recorded in Gmelin's *Handbook of Chemistry*, Vol. X, 1864. Subsequent investigations have added to, rather than lessened, the discords existing at that date.

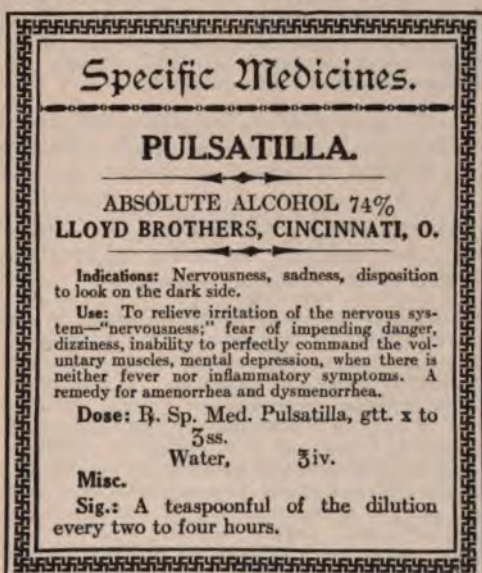
PHARMACEUTICAL PREPARATIONS.—The Pharmacopeia of the United States gives neither formula nor process for any pharmaceutical preparation of pulsatilla. The Pharmacopeia of the American Institute of Homeopathy directs a tincture made of the fresh plant when in flower. The preparation we make, which is used uniformly by practically all authorities mentioned in this publication, is the **Specific Medicine**, prepared from the recent flowering plant or just following the dropping of the bloom. It has the following qualities:

The color is of a deep green, due to natural chorophyl compounds. On the addition of water it becomes opalescent, and if there be sufficient water added, on standing a flocculent greenish precipitate results. Consequently, dilutions of Specific Medicine pulsatilla with water should be shaken or stirred, when each dose is taken. Specific Medicine pulsatilla has an

*Dr. Anthony Störck (Baron Störck), 1781-1803, may be said to have established in professional use the botanical remedies pulsatilla, hemlock, aconite, stramonium, and hyoscyamus. Other botanical remedies, still employed, owe their early conspicuity to Dr. Störck. The Lloyd Library carries his "Medicinal Virtues of Hemlock," with an illustration of the plant, printed in Vienna in 1761, and also his "Libellus, quo demonstratur Stramonium, Hyosclamum, Aconitum," which also is illustrated with large plates of the plants named.

**"Aenemony-camphor. Pulsatilla-camphor. Anemoneum." First observed by Störck (Libellus de usu med. Pulsatillae nigric. Wien. 1771); rediscovered by Heyer in 1779.—The volatile acrid principles (xiv. 471) are perhaps related to the body from which anemonin and anemonic acid are formed."—Gmelin, "Organic Chemistry," Vol. XVI, p. 266.

herby odor, which becomes more pronounced on the addition of water. The taste is first herby and incipient, but if it be in sufficient amount a tingling of the fauces and an unpleasant irritation results. There is no chemical test for the qualities of *pulsatilla*, which (see constituents) are so evanescent as to practically disappear when the plant is dried and aged. The manipulation with chemicals, whether the plant be green or dried (see constituents), results in by-products and decomposition products that are not present in the Specific Medicine prepared from the recent herb.



Original label of Specific Medicine Pulsatilla, written by Professor J. M. Scudder in 1870. Still in use as the front label.

No plant known to this writer demands more care in its selection than does *pulsatilla*. No plant is more readily injured by age. No plant more quickly passes from the proper condition for collecting. Possibly *rhus toxicodendron* or *arisaema triphyllum* are as sensitive, but the constituents of even these are not more evanescent than are those of *pulsatilla*.

PHYSIOLOGICAL ACTION.—The physiological action of pulsatilla is a feature of Dr. Ellingwood's "New American Materia Medica, Therapeutics, and Pharmacognosy," 1916.* From it we reproduce as follows:

"The agent has a direct influence upon the brain and spinal cord. In toxic doses it produces mental hebetude, dilated pupils, coma, and in extreme cases, convulsions. It lessens general sensibility.

"It paralyzes to a mild degree both sensation and motion. It increases, in proper doses, the cerebral functions and imparts tone to the sympathetic system.

*Finley Ellingwood, M.D., late Professor of Materia Medica and Therapeutics in Bennett Medical College, Chicago; Professor of Chemistry in Bennett Medical College, 1884-1898; author of *Ellingwood's Practice of Medicine*; *Ellingwood's Pregnancy and Labor*; editor *Ellingwood's Therapist*; member National Eclectic Medical Association; American Medical Editors' Association.

"In toxic doses it is a heart depressant; it lowers arterial tension, reduces the pulse rate and temperature.

"It exercises an influence upon the heart similar to that of cactus, increasing its power, improving the strength and rate of the pulse and slowing the rapid and feeble pulse of nervous prostration.

"The influence of full doses of pulsatilla, taken into the stomach and intestinal canal, is that of an irritant. In the mouth it acts like aconite or xanthoxylum, producing tingling, burning, and subsequent numbness. It produces a sensation of rawness, and is followed by acid eructations and unpleasant taste. It produces tightness and constriction of the chest, with congestion, chilliness and great weakness. The agent is seldom given in sufficient doses to produce the physiological effects. It operates much more satisfactorily in doses too small to produce such action. It has long been popular with the homeopaths in minute doses."

To the Homeopathic profession is unquestionably due the establishing of pulsatilla in America, in the direction in which it is now generally employed, Professor E. M. Hale, M.D.,* accepting that "the Homeopathic uses were introduced by Hahnemann." Allen** also states that it was introduced into their practice in 1805 by Hahnemann. The Homeopathic materia medicas and journals are prolific in the praise of pulsatilla. Dr. Hale*** gives the following uses of the American variety:

"It is useful in chlorosis, with great nervousness, in neuralgia, characterized by its wandering, erratic character. We find it specific in catarrhal affections, especially in mucous diarrhoea and leucorrhoea. It causes venous congestion, and is useful in varicosis. It has cured urticaria, and itching papulae. It is as useful in nervous or gastric sick headache, as is the pulsatilla of Europe. The pain commences in the nape of the neck, ascends to one side of the head and eye, and is attended by chilliness and vomiting. It has proved specific in conjunctivitis catarrhalis, ophthalmia tarsi, hordeolum, opacity of the cornea, pustules and granulations in the eyes. It is useful in otitis and otalgia from catarrh; in catarrhal angina, when the mucous surfaces are of a livid, purple hue, and covered with mucus. This light purple, or dark violet hue, attends all the local disorders indicating pulsatilla. The indications for its use in gastric troubles are the same as for pulsatilla nig. It has great curative power over disorders of menstruation, regulating irregular menses, restoring suppressed menses, and modifying painful or profuse menses. I have used it successfully in gonorrhoea and orchitis; as well as ovaritis due to suppression of the menses. It is well known that when a catarrhal flux from any organ is suddenly checked, a rheumatic affection of some muscle or joint may result. Here both species of pulsatilla act promptly curative, restoring the discharge and arresting the inflammation. I would advise its use for all the symptoms of pulsatilla nig. It has the advantage of being indigenous, and obtainable pure, and in inexhaustible quantities."

Close following 1868 came its great favor with Eclectic physicians, to whom the loss of pulsatilla in their practice would now (1916) be considered as a therapeutic disaster. The uses of pulsatilla are voiced as follows by Dr. John M. Scudder,**** who first broadly disseminated its virtues in Eclectic literature:

*Edwin M. Hale, M.D., Professor of Materia Medica and Therapeutics of the New Remedies in Hahnemann Medical College, Chicago. Author of Lectures on "Diseases of the Heart," "Characteristics of New Remedies," etc.

**Dr. Timothy Field Allen, for many years Professor of Materia Medica and Therapeutics in the New York Homeopathic College; editor of the Homeopathic Encyclopedia of Materia Medica, and other publications.

***Drugs and Medicines of North America, April, 1884.

****John M. Scudder, M.D., Professor of the Principles and Practice of Medicine in the Eclectic Medical Institute; author of "The Principles of Medicine," "The Eclectic Practice of Medicine," "The Eclectic Materia Medica and Therapeutics," "A Practical Treatise on the Diseases of Women," etc.

"The principal use of pulsatilla is to relieve certain cerebral symptoms with difficulty relieved by other remedies. In some diseases of women, in spermatorrhoea and prostatorrhoea, in heart disease, and some other chronic affections, we find certain head symptoms playing an important part, and giving a good deal of trouble. The patient is nervous, restless, has an active imagination for disease, a fear of impending danger, etc. These symptoms are very unpleasant, and not unfrequently prevent the curative action of remedies. Pulsatilla reaches them and gives prompt and certain relief.

"I would not treat some cases of spermatorrhoea without I could employ this remedy. For with the unnatural excitement of the mind, no remedy would exert a curative influence. So in some cases of heart disease the head symptoms are the most prominent and unpleasant features. Relieve the unpleasant mental sensations and dread of danger, and we have removed a permanent cause of excitement.

"Though pulsatilla is the remedy for nervousness, it must not be given with any expectation of benefit where the excitement depends upon irritation and determination of blood. In this case it will either exert no influence or it will be unfavorable.

"Pulsatilla exerts a marked influence upon the reproductive organs of both male and female. I regard it as decidedly the best emmenagogue, when the suppression is not the result of or attended by irritation and determination of blood; where there is simple suppression from atony or nervous shock, it may be used with confidence. In male or female it lessens sexual excitement. It does not diminish sexual power, but rather strengthens it by lessening morbid excitement.

"There are other uses for the remedy, but those I have named are prominent ones, and readily recognized. I value the remedy very highly, and am satisfied from an experience of twenty years in its use that I do not overestimate it."—**Specific Medication**, 1870.

Experienced physicians of all schools now employ pulsatilla in all confidence. The fact that it was dropped from the Pharmacopeia of 1900 has not prevented physicians from increasingly prescribing the remedy, the demand for it being now greater than ever before.*

That exceptional authorities in the dominant school of medicine consider pulsatilla of the highest importance, is shown by the booklet (1910) of Professor Chauncey D. Palmer, M.D.,** titled "The Clinical Use of a Selection of Vegetable Remedies." Of pulsatilla he says:

"Pulsatilla is an old remedy, but one that has been much neglected, excepting by the Eclectics and the Homeopaths, with whom it is a great favorite. Why should any physician, regardless of school or source of education, deny himself its usefulness? I wish merely to refer to it here as a most valuable medicine, for not a few cases of painful menstruation, especially that form called neuralgic, and I think properly so. Not a few cases of this disease are essentially neurotic in form. Most common they are in the unmarried, commencing often at puberty, the attacks becoming, to appearances, more and more severe each additional year of life, until at such times the patients are wholly disabled and incapacitated for any physical or

*In the opinion of this writer, the Pharmacopeia of the United States can neither make, nor unmake, the uses of remedies employed by physicians. Its function is that of a descriptive work, and it is scientific authority for drugs and compounds introduced to its pages with each revision. The dropping of a drug previously included does not necessarily indicate that physicians using that drug in their practice will stop employing it, nor does the introducing of a drug previously unrecognized compel physicians to employ it in their practice, unless the suggested drug has an advantage over others then in use.—J. U. L.

**Prof. Chauncey D. Palmer, M.D., Emeritus Professor of Obstetrics, Gynecology, and Clinical Gynecology, in the Medical Department of Cincinnati University. Author: "American System of Gynecology," 1883; "Clinical Gynecology," 1895; "American Text of Obstetrics," 1904; "Jewett's System of Obstetrics," 1905. Member of various professional societies, including the Cincinnati Academy of Medicine, Cincinnati Obstetric Society, Ohio State Medical Society, and the American Gynecological Society, A. M. A.

mental exertion, too often becoming confirmed examples of hysteria and neurasthenia.

"Administered to such patients, in moderate doses of the Specific Medicine pulsatilla, three times a day during the menstrual interval, and every one to more hours, according to the severity of the pain during the menstrual time, permanent cures follow in many cases, and marked beneficial results in most others.

"It is impossible to lay down rules for specific differentiation between the remedies pulsatilla and cimicifuga. As a rule, for dysmenorrhea of the virgin or the unmarried, I give the choice to pulsatilla; while to the married, before pregnancy or after its occurrence, I have preferred cimicifuga.

"Pulsatilla is also a remedy for the reflex neuroses of women, of uterine and ovarian origin, as nervous erethism, sleeplessness, neuralgic pains, and hystero-epileptic attacks."

Dr. Thomas S. Blair,* likewise a recognized authority in the dominant school, in his "Abstracts from a Practitioner's Handbook of Materia Medica and Therapeutics," records as follows

"PULSATILLA. In Moderate doses it is of value in diseases of the reproductive organs caused by deficient or defective innervation, and also inversely, in hysterical, melancholic, and spasmodic manifestations induced by sexual derangements. Amenorrhea with mental perturbation, spermatorrhea, menstrual disorders with headache, chilliness, languor, nausea, water-brash, and nervousness, as well as some cases of hysterical convulsions and the urinary irregularities of pregnancy, all respond nicely to this drug if properly pushed, but it is not a remedy for pain except incidentally as it relieves spasm. Homeopaths assert that pulsatilla exercises a greater influence over women than over men, and more particularly women of lax fibre, of mild and yielding disposition. Probably that is true. We know the susceptibility of blonde women to belladonna. At all events, it is probable smaller doses will suffice than with women of the opposite type.

"In small doses (or even the first dilution) it exercises an influence upon the circulation partaking somewhat of the natures of both aconite and cactus, reducing inflammation in mucous membranes and equalizing the circulation. It differs from aconite in that it is more antispasmodic in small doses, and it influences the catarrhal stage of congestions and inflammations rather than the initial stage. For this reason, it frequently should follow aconite and sometimes alternate with it. Pulsatilla, like a great many other remedies, should seldom be used in combination. We get most of our best results from the single drug. This is the single drug directed to catarrhal congestions, which is a wide field. The thick, bland, and yellow or yellowish-green discharge is most affected.

"The following will simply suggest its range in this direction: Temporal neuralgia with lachrymation of affected side, otorrhea, catarrhal otitis, styes, agglutinated eyelids, ophthalmia neonatorum, subacute conjunctivitis, effects of 'colds' upon eyes and ears, coryza with yellow discharge, toothache relieved by cold and due to acute congestion, catarrhal states of gastro-intestinal tract, creamy leucorrhea, catarrhal stage of gonorrhea, orchitis, acute prostatitis, greenish expectoration with cough, catarrhal symptoms of measles, and in fevers when patient seeks the open air."

It will be seen that different authorities, regardless of the schools of medicine with which they affiliate, agree on the uses of pulsatilla, probably

*Thos. S. Blair, M.D., member American Medical Association, Pennsylvania State Medical Society, Harrisburg Academy of Medicine; member visiting staff of Harrisburg City Hospital, etc. Author of "A Practitioner's Handbook of Materia Medica and Therapeutics."

no drug of the entire materia medica being more cosmopolitan. Dr. Fyfe's* revision of **Specific Medication and Diagnosis** (Scudder), gives the indications for pulsatilla as follows:

"INDICATIONS.—Irritation of the nervous system, associated with wrongs of the reproductive organs of both men and women; menses scanty or tardy; sense of fullness and weakness in the back and hips of women; nervousness, despondency and fear of impending danger; conditions in which the patient is frequently moved to tears (even in sleep in extreme cases), and still she is unable to give any sufficient reason for doing so; nervousness with sleeplessness; head symptoms common to functional affections of the reproductive organs of both men and women; nervous conditions caused by mental over-exertion or the excessive use of tobacco."

From the five-page article in Volume 2 of the **AMERICAN DISPENSATORY** (Felter), we extract as follows:**

"Pulsatilla is a remedy of wide applicability, but more particularly for those conditions in which the mind is a prominent factor. A gloomy mentality, a state of nerve depression and unrest, a disposition to brood over real or imagined trouble, a tendency to look on the dark side of life, sadness, mild restlessness, and a state of mental unrest generally denominated in broad terms 'nervousness,' are factors in the condition of the patient requiring pulsatilla. A pulsatilla patient weeps easily, and the mind is inclined to wander—to be unsettled. The pulse requiring pulsatilla is weak, soft, and open, and the tissues have a tendency to dryness (except when the mucous tissues are discharging a thick, bland material), and, about the orbits the parts appear contracted, sunken, and dark in color. The whole countenance and movements of the body depict sadness, moroseness, despondency, and lack of tone. Hysteria of the mild and weeping form may be a symptom. The whole condition is one of nervous depression, the nutrition of the nerve centers are at fault. With such symptoms, pulsatilla may be confidently prescribed in the conditions and disorders enumerated in this article. Pulsatilla may be given to produce sleep, when there is great exhaustion and opiates are inadmissible. If the insomnia depends upon determination of blood to the brain, pulsatilla will not relieve, but when due to nervous exhaustion it is a prompt remedy to give rest, after which sleep obtains. Where sleep is disturbed by unpleasant dreams, and the patient awakens sad and languid, pulsatilla should be given. Pulsatilla has a large field in troubles incident to the reproductive organs of both sexes. As an emmenagogue, it serves a useful purpose in **amenorrhoea** in nervous and anemic subjects, with chilliness a prominent symptom. When menstruation is suppressed, tardy, or scanty from taking cold, or from emotional causes, pulsatilla is the remedy. In **dysmenorrhoea**, not due to mechanical causes, and with the above-named nervous symptoms, no remedy is more effective. **Leucorrhoea**, with a free, thick, milky, or yellow, bland discharge and pain in the loins, and particularly in scrofulous individuals, calls for pulsatilla. It is a remedy for mild forms of **hysteria**, where the patient is weak and weeps easily, has fears of impending danger, and passes large quantities of clear, limpid urine, and menstruation is suppressed.

"The long-continued use of pulsatilla as an intercurrent remedy, is accredited with curative effects in **uterine colic**, but it is of no value during an attack. Pulsatilla frequently proves a good remedy in **ovaritis** and **ovaralgia** with tense, tearing pain. Sluggish, ineffectual, and weak labor-

*John William Fyfe, M.D., formerly Professor of Specific Medication in the Eclectic Medical College of the city of New York; author of "Essentials of Modern Materia Medica and Therapeutics;" President of the Connecticut Eclectic Medical Association; President of the Connecticut Eclectic Medical Examining Board.

Harvey Wickes Felter, M.D., Adjunct Professor of Chemistry, Pharmacy, and Toxicology, and Professor of Anatomy in the Eclectic Medical Institute, Cincinnati, Ohio; editor of **Locke's Syllabus of Materia Medica and Therapeutics; ex-President of the Ohio State Eclectic Medical Association, etc.

pains are sometimes remedied by this drug. It is frequently a remedy for pain, when dependent on or associated with debility, and sometimes when due to acute inflammation. It is a leading remedy in **epididymitis** and **orchitis**, whether due to gonorrhoeal infection or to metastasis from mumps. The dark-red, congested, enlarged, and sensitive testicle indicates it. It relieves the pains of **orchialgia**, and subdues **mammary swelling** from the metastasis of mumps. Pulsatilla increases sexual power, but lessens **morbid sexual excitement**. It is especially valuable in relieving urethral irritation and consequent **spermatorrhoea** and **prostatorrhoea**. In these troubles it overcomes the nervous apprehension so frequently a troublesome feature. It also alleviates the nervous irritability accompanying or produced by **varicocele**. In **gonorrhoea**, particularly of the chronic type, pulsatilla is of value, when the urethral membrane is swollen."

In the application of botanical remedies to diseases of children, there is perhaps no better authority than Professor W. N. Mundy, M.D.,* a specialist in children's diseases, who has an enviable record, both as a teacher and as an author. In his **Diseases of Children**, he thus records the uses of pulsatilla:

"PULSATILLA.—Specific Indications.—The child is restless, weary, cries frequently, sobbing even in sleep, face pale and expressionless, pulse small and feeble.

"Dose.—B. Pulsatilla gtt. x. to 3ss., water ℥iv.; a teaspoonful every three or four hours.

"Though pulsatilla has a more direct action upon the reproductive organs, and is especially useful in diseases of the female, it still has its place in diseases of children.

"In pale neurasthenic children, who are restless, with active imaginations and a fear of impending danger, pulsatilla excels.

"In nervous heart troubles and headaches, where little patients are pale, nervous and restless.

"Though useful in nervous troubles, pulsatilla is not the remedy where there are irritation and determination of blood."

The veteran New York author and teacher, Professor Geo. W. Boskowitz, M.D.,** made pulsatilla a feature in his lectures. From the compilation of Dr. Victor von Unruh we present as follows:

"PULSATILLA, *Anemone Pulsatilla*, Meadow Anemone,—Ranunculaceae,—Europe.

"SPECIFIC SYMPTOMATOLOGY.—Feeling of impending danger, apprehension of trouble.

"PHYSIOLOGICAL ACTION.—It has a special action on the brain and cord. The toxic dose produces a dilatation of the pupils, coma, and convulsions. A sudden large dose acts upon the heart as a depressant. It lessens general sensibility. Small and frequent doses are better than large doses; gtt. V—VIII in whatever other mixture is indicated.

*William Nelson Mundy, M.D., formerly Professor of Physical Diagnosis, Hygiene, and Clinical Diseases of Children in the Eclectic Medical Institute, Cincinnati, Ohio. Member of the National Eclectic Medical Association, ex-President of the Ohio State Eclectic Medical Association, etc. Author of "Diseases of Children."

**"Extracts from Lectures on Therapeutics," by Geo. W. Boskowitz, A.M., M.D., delivered at the Eclectic Medical College of the City of New York, session 1909-10. Compiled by Victor von Unruh, M.D.

"Dedicated to George Washington Boskowitz, A.M., M.D., President of the Eclectic Medical College of the City of New York. In warm appreciation of his untiring labors in the class-room and his zealous interest in the welfare of his students, who, with those that have gone this way before, wish to see perpetuated and commemorated what he has accomplished in the cause of Eclecticism."

"ADMINISTRATION.—In female irregularities.

"In functional derangements of male and female reproductive organs.

"In hysterical convulsions due to uterine troubles.

"During pregnancy where mental state is depressed.

"In spermatorrhea.

"In orchitis, specific or otherwise; combined with phytolacca, gelsemium, or aconite. (For cases of orchitis the 'Miliari' suspensory is recommended.)"

Dr. J. S. Niederkorn,* in his "**Handy Reference Book**," mentions pulsatilla very prominently as indicated in many different disease expressions, when administered under the qualifications specified in his introduction. The following quotations from this work of Dr. Niederkorn, (**A Handy Reference Book**), show the scope of pulsatilla's usefulness, as established in his practice, regardless of the name the disease, or the location of the organ affected. It may be said in passing that the **Specific Medicine** is the only pulsatilla preparation employed by Dr. Niederkorn.

"'There are no specifics in medicine' is a phrase pretty nearly correct when it is intended to mean that no remedy is a specific for any named disease, such as typhoid fever, pneumonia, etc.; but that we have specific medicines prescribed with the intention of overcoming or opposing well-defined pathological conditions is a fact positively established.

"A remedy should not be employed because it proved curative in any given named disease, or because some one recommended its employment in this or that disease; but its use in any case should be governed by the condition existing; the remedy should be exhibited to meet definite pathological conditions, irrespective of any disease name."

The following quotations show the scope of pulsatilla's usefulness as established in Dr. Niederkorn's practice, regardless of the name of the disease, or the location of the organ affected:

SPECIFIC MEDICINE PULSATILLA.—This pulsatilla preparation is used exclusively in Dr. Niederkorn's practice.

Mental depression, nervousness, dizziness, restless, has an active imagination for disease, fear of impending danger, sadness, tendency to weep. **Dose:** Twenty to 30 drops to 4 ounces water, mix; teaspoonful every 2 to 3 hours.

"Nervous cough, cough of nervous origin, patient generally nervous. **Dose:** One drop, or less, every 2 hours.

"Severe neuralgic pains in ear; nervous deafness; pain from exposure to winds. **Dose:** One-half to 1 drop every 1 to 3 hours.

"Visual disturbances due to hysterical conditions or sexual derangement; styes. **Dose:** One-half to 1 drop every 2 hours.

"Palpitation, nervousness, fear of impending danger, restlessness, possibly some sexual disturbance exists. **Dose:** One-half to 2 drops in water every 2 to 3 hours.

"Patient can not command functions of his brain, headache, nervous, is fearful; sexual excitement. **Dose:** One to 2 drops in water every 2 hours.

"Delayed and scanty menstruation, with mental distress; nervousness, restlessness, fearful of imaginary danger; sense of weakness in back and hips at menstrual period, dark lines under eyes. **Dose:** Thirty drops to 4 ounces water, mix; teaspoonful every 2 hours.

"Nervous dysphagia, with the usual pulsatilla symptoms. **Dose:** One drop every 3 hours.

*"A Handy Reference Book, Giving Briefly the Specific Indication for Remedies, Paying Particular Attention to Each Organ of the Body Distinctively." By Joseph S. Niederkorn, M.D., Versailles, Ohio.

"The nervous, restless, despondent, apprehensive patient, down in spirits, cries easily—and there is usually some sexual wrong present. **Dose:** Thirty to 60 drops to 4 ounces water, mix; teaspoonful every 2 to 4 hours.

"Pulse soft and easily compressed, nervousness. **Dose:** Twenty drops to 4 ounces water, mix; teaspoonful every 2 hours.

"Simple testicular inflammation; nervous and despondent, fearful of imaginary troubles, apprehensive, sexual excess with spermatorrhoea, nervous debility. **Dose:** Thirty to 40 drops to 4 ounces water, mix; teaspoonful every 2 to 3 hours.

"Ptyalism of nervous origin, the usual pulsatilla indications."

Dr. R. L. Thomas,* Professor of the Principles and Practice of Medicine in the Eclectic Medical Institute, Cincinnati, is an earnest believer in pulsatilla properly prescribed according to the indications demanding the remedy, as is shown throughout the pages of his "Practice of Medicine." We quote from his condensed indications for remedies, as follows:

"PULSATILLA.—Patient is nervous, despondent, restless, sleepless, pulse soft, easily compressed; eyes dull, dark line under them; reproductive excitement; fear of impending danger; menses arrested, tardy, scanty—gtt. x. to gtt. xxx., water $\mathfrak{z}$ iv."

Dr. Ellingwood (see page 5) most elaborately records the uses of pulsatilla as established in his practice. From that we extract as follows:

SPECIFIC MEDICINE PULSATILLA.—**Dose:** From 5 to 20 drops in 4 ounces of water; teaspoonful every 2 hours.

"In studying its medicinal influence on the circulation, pulsatilla is said to act in much the same manner as aconite during fevers, where there are high nervous manifestations. It equalizes the circulation somewhat like belladonna it is thought. Where catarrhal disorders are present, subacute in character, with congestion and a free discharge of thick, bland, yellow, or yellowish green mucus, it seems to act directly, except in chronic catarrhal conditions. This remedy will act satisfactorily only when the precise indications for which it should be prescribed, are present.

"SPECIFIC SYMPTOMATOLOGY.—Homeopathic physicians declare fearfulness as an indication, anticipation and dread of calamity, fear of trouble or death; in male patients suffering from sexual excesses, with spermatorrhoea, threatened impotency, prostatorrhoea, with fear of approaching imbecility. We find it indicated in **amenorrhoea**, with mental perturbation, great apprehension of trouble. **Spermatorrhoea**, with fear of dire results. The remedy is especially efficacious when existing disorders of the reproductive organs are a cause of extreme anxiety.

"In addition to the well known indication, I might say that it is of value in disorders of the reproductive organs which depend upon defective innervation, and which are usually accompanied with manifestations of hysteria or melancholia, or which depend upon sexual derangements and menstrual disorders which are accompanied with loss of strength, chilliness, more or less headache, and gastric derangements, such as nausea, eructation of sour water, and other nervous manifestations.

"Its best influence is exercised in women of blonde temperament, particularly of lax muscular fiber, and of mild and yielding disposition, and smaller doses with these patients will produce better results than larger doses with other patients. Some writers claim that it may be given during the progress of inflammation of the mucous membranes, prescribed in much the same manner as aconite would be prescribed, or as cactus is given.

*Rolla L. Thomas, M.S., M.D., Professor of the Principles and Practice of Medicine in the Eclectic Medical Institute, Cincinnati; ex-President of the National Eclectic Medical Association; Consulting Physician to the Seton Hospital; Member City, State, and National Eclectic Medical Associations, etc. Author of "Practice of Medicine." See page 2.

"It acts best in the catarrhal stage of inflammation rather than in the initial stage, and in this it differs somewhat from aconite.

"THERAPY.—Its influence is especially directed to that portion of the sympathetic nervous system influencing the **reproductive organs**. It increases the tone and functional power of these organs, and overcomes irregular, imperfect, or deficient action.

"It is prescribed in **uterine disorders** which induce melancholia and hysteria.

"It has an apparent antispasmodic or nerve-soothing influence, which renders it valuable in **hysteria** and general nervous irritation with convulsive phenomena, in the absence of acute inflammation, blood determination or fever. A few physicians laud it highly in **hysterical convulsions** and in convulsive conditions due to **uterine disorders**.

"In **general nervousness** due to chronic uterine disorder, with or without hysteria, with despondency and nervous irritation, pulsatilla is an excellent remedy. It may be given in doses of one drop, frequently repeated. In deficient, suppressed, and **irregular menstruation**, with the above symptoms, it is of rare value. It will quickly promote a normal and regular flow.

"It is an excellent agent in small, frequent doses when the mental conditions above named are present **during pregnancy**, with a general relaxed and atonic condition. Its influence in these cases is enhanced by combination or alternation with macrotys. It certainly improves the general condition and conduces to a normal and easy labor.

"It is needed during the pregnant state to correct hysterical manifestations and urinary irregularities. It acts better in the catarrhal stage of inflammation, rather than in the initial stage.

"In **nervous exhaustion**, with feeble pulse and deficient capillary circulation, cold extremities and a generally relaxed physical condition, it will serve an excellent purpose combined with other nerve tonics, or in conjunction with the directly indicated remedies."

It will be seen from the foregoing botanical and therapeutic histories that pulsatilla, from the date of medieval medication, has been esteemed as a valued remedy. It is also established that, beginning with the days of Störck (1761), "Chief physician to Her Most Sacred Majesty the Empress Queen, and physician to the Pazmarian Hospital of the City of Vienna," pulsatilla has been valued by physicians of every prominent section in legalized medicine, European as well as American.* The reproductions we have made from American publications of the three principal schools in medicine, establish its value with American therapeutic authorities. To this we will add that every authority named has been a user of pulsatilla, and not alone a compiler of what others have recorded. This is remarkable because, as a rule, medical authors are privileged to accept statements of authorities, past as well as contemporary, regarding drugs not personally used by the compiling author.

In recent years, an impression has been gaining in certain directions, that **practicing physicians** should be recognized as being the final authority as concerns the clinical value of remedies. In order that the American physician's view of the uses of pulsatilla in actual practice be fully comprehended, we extract from current medical literature of recent years a few of the many reports that have been presented by American physicians. Some of these are abstracts from long articles on general subjects:

"PULSATILLA.—This is a very frequently prescribed remedy. It is our remedy for nervous females and children. The patient has gloomy

*Probably Störck gained his introduction to Pulsatilla through physicians of repute.

forebodings, cries easily, is pale and anemic. We do not believe there is a more efficient remedy for nervousness, especially when associated with menstrual derangements. We have seen in such cases a pulse of 120 fall to 78 in a week, under the influence of Specific Medicine pulsatilla. We have already spoken of its use in suppressed menstruation, in combination with Specific Medicine gelsemium, and it will be unnecessary to repeat what has been said. We value this remedy highly, and probably prescribe it as frequently as any other we use. **Dose,** 3ss to 3i in half a glass of water, teaspoonful of the mixture every one to four hours."—**W. N. Mundy, M.D.**

"Specific Medicine pulsatilla and bromide of potassium, where the hot flashes and pains pass rapidly from pelvic cavity to the back, from back to head, then downward again."—**J. D. McCann, M.D.**

"Pulsatilla is a remedy for 'nervousness,' especially when associated with disease of the reproductive organs or functions. Fear of impending danger, dizziness, nervous dysphagia, unrest, and tendency to look on the dark side, are among the indications. It exerts a special influence upon the reproductive organs of both male and female, controlling sexual excitement in both, and is a prominent remedy to restore normal menstrual function, and to relieve some unpleasantness during gestation.

"Pulsatilla should not be overlooked as a remedy for gonorrheal orchitis and gonorrheal epididymitis, especially if the patient be melancholic. In acute inflammation of the middle ear, due to cold, it is often prompt in allaying pain and hastening a cure. A very efficient remedy in catarrhal conditions, especially the second stage of acute nasal catarrh."—(From Descriptive Label) **Ford Scudder, M.D.**

"SPECIFIC MEDICINE PULSATILLA, though a medicine for certain nervous conditions in both sexes, is par excellence, the woman's remedy. In diseases of the female genito-urinary organs, accompanied by extreme nervousness, wherein the patient is despondent, fearful of danger, fears to go out alone, weeps without cause, is troubled with insomnia, is irritable and fault-finding, pulsatilla is the remedy. Many reflex neuroses, associated with menstrual derangement, are relieved by its use.

"Pulsatilla may be relied upon in the treatment of amenorrhea and dysmenorrhea when the specific indications are present. It is often combined with Specific Medicine black haw, Specific Medicine macrotys, and Specific Medicine gelsemium, with excellent advantage in the treatment of diseases of women. In sexual excitement of both sexes, when the indications are present, it exerts a positive action. It is a valuable remedy in spermatorrhea and prostaticorrhea under like conditions. It should not be overlooked in the treatment of orchitis and epididymitis when the patient is nervous and apprehensive.

"In melancholia, when the female patient is gloomy and foreboding, pulsatilla will cheer her up.

"Pulsatilla is one of our best remedies for functional diseases of the heart, and we possess no better remedy for purely nervous headache and asthma of nervous origin. In acute otitis media, pulsatilla will often allay promptly the pain and hasten the cure.

"INDICATIONS.—Nervousness, sadness, disposition to look on the dark side.

"SPECIFIC USE.—To relieve irritation of the nervous system—'nervousness,' fear of impending danger, dizziness, inability to command perfectly the voluntary muscles; mental depression, when there is neither fever nor inflammatory symptoms. A remedy for amenorrhea and dysmenorrhea."—**A. F. Stephens, M.D.**

"PULSATILLA—Dose: Specific Medicine, gtt. x. to 3i. in 3iv. of water; one teaspoonful of the mixture every one to four hours. Some of its indications are fear of impending danger, restlessness, sleeplessness, and the patient is anemic. The heart often palpitates, and frequent sighing and

even crying are often observed. Following these indications I use it in the suppression of the menses, scanty or tardy menstruation, leucorrhea, hysteria, and spermatorrhea. I find it a most useful remedy in labor of nervous women, when the pains are inefficient and the patient believes she is going to die. This remedy has other valuable indications."—**Benj. L. Simmons, M.D.**

"**PULSATILLA** is useful in any disease where the patient has a fear of impending danger; in functional heart disease and in dyspepsia where there is an inability to digest fats, with eructation of greasy matter. It is a valuable remedy in a great many diseases of women; in nervous headache where the pain is in the top of the head with a sense of heat and burning of the scalp. It is useful also in some forms of leucorrhea."—**J. C. Ellis, M.D.**

"**SPECIFIC MEDICINE PULSATILLA.**—Nervous patients, full of imaginings, gloomy forebodings, mental depression, all this in any case, and particularly so if some sexual derangement exists. The patient is always fearful of some unknown danger, and cannot sleep. Cardiac difficulties, accompanied by some of these nervous manifestations. With leontin, or hyoscyamus, pulsatilla is my favorite in amenorrhea and dysmenorrhea, if not due to anemia."—**J. S. Niederkorn, M.D.**

"**PULSATILLA** is indicated in all cases of irritation of the nervous system, associated with wrongs of the reproductive organs of both men and women. In the treatment of abnormal conditions peculiar to females, it occupies a place which cannot be filled by any other drug. Some patients are frequently moved to tears without being able to give sufficient reason for their grief. Pulsatilla will remove this condition. Add ten to thirty drops of the specific medicine to four ounces of water, and give one teaspoonful of the mixture every one to three hours."—**John W. Fyfe, M.D.**

"**PULSATILLA.—Specific Indications.**—The patient is nervous and despondent; cried easily; the pulse is small and frequent, but soft; cold extremities; menses tardy and scanty; uneasiness with depression; a sense of fullness and weakness in the back and hips at the menstrual period; nervous headache and dizziness; hysterical excitement.

"**Dose:** The dose of the Specific Medicine is from a fraction of a minim to two minims. The small dose is best."—**A. F. Stephens, M.D.**

"**PULSATILLA, SPECIFIC MEDICINE.**—Despondency, nervousness, tendency to look on the dark side, pain in the top of head, emenorrhea, dizziness."—**Lyman Watkins, M.D.**

"**PULSATILLA** in large doses will lessen general sensibility and will produce hebétude, dilated pupils and coma in toxic doses. Taken in the mouth it produces a similar effect to aconite. It should never be used in large doses. In medicinal doses it increases the cerebral function and gives tone to the sympathetic nervous system.

"This remedy has a specific effect upon patients who are inclined to look on the dark side, when not caused by financial or social discord. We think of it in the mild, gentle, discouraged patient, one that weeps while trying to relate her symptoms. The patient will often present a confusion of symptoms, often contradicting herself. She will magnify this symptom now. Again she will magnify another. Finally she, in her confusion, begins to weep, and says, 'Doctor, I suffer so much and everything seems to go wrong; I don't believe I will ever be any better.' Persons with light and sandy hair, blue eyes, inclined to silent grief, with submissiveness are cured by this remedy, as if by magic.

"Pains, whether rheumatic or neuralgic, shifting from one part of the body to another, or a changeable disposition, should be considered an indication for pulsatilla.

"The patient weeps; is now irritable, now pleasant. In these conditions pulsatilla may be given with confidence. In metrorrhagia, where the flow comes and goes at short intervals, it is a most excellent remedy. Miss H.,

several years ago, told the following story. 'I have been unwell for several years with short intermissions, and I have tried many physicians in hope of effecting a cure. My old family physician has treated me locally for several months, but without relief. I have despaired of ever regaining my health.' Here she began to weep. Upon questioning her, I found that despondency had been a constant symptom from the beginning.

"The indication for pulsatilla was so pronounced in her case that I gave it alone, in one drop doses, every four hours.

"Within three months she was so much improved I felt sure the treatment would result in a complete cure. The pulsatilla was continued, and at the end of the fifth month she had her natural menstruation, and she has been regular ever since, for seven years at least.

"I have had good results from this remedy in hysteria. It has a beautiful effect in orchitis and spermatorrhea. It allays irritation of the prostate gland. During pregnancy, if the patient be despondent, with a general atonic condition, pulsatilla should be given.

"Urinary disturbances of the pregnant state are often promptly relieved by pulsatilla. As a partus preparator, together with macrotys, it is indispensable. It not only facilitates labor, but its after effect is wonderful. In stomach troubles I use pulsatilla and nux vomica combined with splendid results. There is no remedy that braces the action of nux vom. more than pulsatilla.

"Dr. Curryer gives the following as choice symptoms for pulsatilla: 'In diseases following badly managed measles, in metastasis of gonorrhea, or mumps, to mammae or testicles, cystitis, periodical headaches in which pressure relieves, chilliness with pains, yet where coolness is more agreeable than warmth, one-sided sweats, and pulsations over the body.'

"In any complaint, either local or systemic, where the pulsatilla mind and modality is present, we expect to relieve or cure."—J. P. Harvill, M.D.

"PULSATILLA.—This is especially indicated in all cases of dizziness, if not caused by constipation. In uterine reflex; in fact, in all reflex conditions emanating from the womb, the Specific Medicine pulsatilla will cure. Speaking more carefully, let us illustrate by a typical case.

"Mrs. A. is suffering from a condition of extreme nervous fear, a sense of impending danger, looks on the dark side of the picture, is easily provoked to anger, has fits of weeping, walks unsteadily, is inclined to bear to the right in walking, has dark semi-circles under the eyes, and complains of pain in the top of the head; in all or any of these symptoms pulsatilla will cure. If any of these symptoms appear in the male, they are indicative of prostatic reflex, that will be relieved by the administration of pulsatilla.

"Pulsatilla enters into a beautiful combination with macrotys and viburnum as an efficient emmenagogue in cases of dysmenorrhea or amenorrhea—in fact, in all functional deviations of the uterus. It quells inordinate sexual desire, and increases sexual vigor if lacking; it also arrests a hypersecretion of semen.

"I have often thought that nine-tenths of the cases of insanity are caused by reflex diseases of the sexual organs in both male and female, and that many of those cases of insanity might be cut short in their incipency by the use of pulsatilla.

"I have on several occasions arrested an attack of insanity, when it was clearly indicated, by the use of pulsatilla."—A. J. Smith, M.D.

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A TREATISE ON CRATAEGUS

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The important article by Dr. J. A. HOFHEIMER, on Angina Pectoris, with especial reference to the use of Crataegus Oxyacantha in its treatment, appeared originally (1916) in *American Medicine*, New York.

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The Illustrations of Crataegus Oxyacantha are from the British Flora. That of Crataegus Coccinea was drawn for this publication.

The Description, History, Chemistry, and Pharmaceutical Record are by JOHN URI LLOYD.

Treatise No. I—Thuja Occidentalis.
Treatise No. II—Cactus Grandiflorus.
Treatise No. III—Pilocarpus (Jaborandi).
Treatise No. IV—Veratrum Viride.
Treatise No. V—Chionanthus Virginica.
Treatise No. VI—Asepsin and Asepsin Soap.
Treatise No. VII—Collinsonia Canadensis.
Treatise No. VIII—Nux Vomica.
Treatise No. IX—Geisemium.
Treatise No. X—Belladonna.
Treatise No. XI—Oenanthe Crocata, Vegetable Caustic and Crataegus.
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Treatise No. XVII—Mangifera Indica and The National Pure Food and Drug Act.

Treatise No. XVIII—Libradol.
Treatise No. XIX—Sulphurous Acid, Hydrochloric Acid, Carbolic Acid, Sodium Sulphite, Sodium Phosphate and Ferri Acetas.
Treatise No. XX—Cupri Acetas, Carbo Vegetabilis and Triturated Podophyllin.
Treatise No. XXI—Apis, Tela Araneae and Cantharides.
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Treatise No. XXVIII—Pulsatilla.
Treatise No. XXIX—Crataegus (revised No. XI).

Drug Treatise, No. XXIX.

Revised (1917) from Drug Treatise No. XI.
Pages 2 to 7 inclusive comprise the original articles in No. XI.

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Crataegus.

(HAWTHORN.)



CRATAEGUS COCCINEA.
[An American species of *Crataegus*.]
Drawn for this publication.



CRATAEGUS OXYACANTHA.
[English Hawthorn.]
From British Flora.

A thicket tree, of which the species *Crataegus Oxyacantha* is abundant throughout Europe, being especially cultivated in England as a hedge. It has been successfully introduced into America, where a dozen or more species of *Crataegus* are native, all being marked by close relationship characters.

History—A well-known physician, the late Dr. Green, of Ennis, County Clare, Ireland, attained an extended reputation in the treatment of "Heart Disease," keeping the remedy a secret. Upon his death, in 1894, his daughter revealed the fact that this "famous" cure was a tincture of the ripe berries of *Crataegus Oxyacanthus*.

The first conspicuous American reference to the remedy was an article by Dr. J. C. Jennings, of Chicago, 1896, in the *New York Medical Journal*, followed by an editorial selection, 1898, which drew further attention to the drug. Our study of the various species of *Crataegus* dates from 1896, at which time, owing to Dr. Jennings' paper, interested physicians sought our services in behalf of an authentic preparation, among these physicians being Dr. H. P. Whitford, whose comprehensive experience is recorded in this

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paper. Possibly we are the only pharmacists to have made a study of the various species and varieties of *Crataegus*, bark, root and root-bark, the result being that we have reason to believe that our efforts have been of much service to physicians, for notwithstanding our questioning the value of *Crataegus* and our fear it might be overestimated, the preparation under our "Specific Medicine" label has attained conspicuous reputation.

Part Used.—The part used in medicine is the ripe fruit, this being employed by Dr. Green, who used a tincture of the fruit of *Crataegus Oxyacantha*. When immature the berry, known as "haws," has a green color which on ripening becomes red. It has an astringency, and the fruit of some species possesses a flavor not unpleasant to some persons. When fully ripe, the haws are eaten by children. This is particularly true of some American varieties, one known as "mush haw" being quite palatable. The imported berry is easily obtained, and is readily imported from England, fresh, and in good condition. At first, we made only a tincture, or Fluid Extract of the imported Hawthorn berries, but comparative investigations finally led us to the conclusion that this berry is inferior to one of the American species, and accordingly we finally placed the Specific Medicine of that *Crataegus* berry on the market.

Preparations.—*Crataegus* berries are worked by different methods, and by means of different menstrua. They are sold under various labels, such as Tinctures and Fluid Extracts of *Crataegus*, and they vary markedly as found in commerce. We supply under the name *Crataegus* the afore-named Specific Medicine unless other preparations are directly specified, such as tincture of the European Hawthorn berry, or tincture of Hawthorn bark or of the root when we supply such as are designated. In this connection we will add that the bark and root were both shown by our investigations to be therapeutically valueless in the field the berry occupies.

Specific Medicine *Crataegus*.—This preparation has a brown-red color, a fragrant, wine-like or fruity odor, and a pleasant taste. It gives an acid reaction, and when dropped into water mixes without precipitation. It cannot, as is the case of so many heart tonics, be classed with poisonous remedies, for its sensible characteristics are not marked. We consider this the typical and best preparation of *Crataegus*. It can be taken in large doses for a long period without impairing digestion or producing other ill effects, and it has no cumulative action.

Medical Properties of *Crataegus*.—Prof. Felter (*Amer Disp.*), states that the field in which this remedy is claimed to be of

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value is that of "a curative remedy for *organic and functional heart disorders*, including *cardiac hypertrophy*, with *mitral regurgitation* from valvular insufficiency, and *angina pectoris*. Sometimes *spinal hyperemia* is associated with the latter, when both are said to be relieved by the drug."

Possibly the growing interest in Crataegus may be more comprehensively shown physicians by reproductions of the articles already referred to, together with the report of Dr. Whitford's experience with Specific Medicine Crataegus, than by a summary made by an editor. We, therefore, present these contributions in detail, believing that they embrace the sum of what the friends of Crataegus have to offer in behalf of the claims of the remedy. In this connection we will say that, as in all other cases, indicated remedies should not be neglected.

An excellent example of the value of indicated remedies in fortifying a central preparation is shown in Prof. Bloyer's article on *Cactus Grandiflora*. This we will mail on application.

THE USES OF CRATAEGUS.

BY H. P. WHITFORD, M. D., Bridgewater, N. Y.

My experience with this agent commenced with the commencement of its manufacture by Lloyd Brothers, of Cincinnati, Ohio. Have used the Specific Medicine exclusively in my practice since its introduction. I do not consider it a "cure-all," but no one agent has given better results in its sphere of action. In weak hearts, with consequent capillary congestion, with effusion, even where valves are so diseased as to eventually cause death, it has proved of great benefit. A few *prominent* cases from practice will perhaps best illustrate its value. One of my first trials was in the case of a lady of Babcock Hill, N. Y., who had been suffering for a number of years with ulcerative laryngitis, bronchitis, with involvement of apex of left lung. Was expectorating grumous pus freely, pulse feeble, irregular, and over 100 per minute when it could be counted. Effusion into entire cellular tissue of body and limbs, and abdomen so distended as to interfere with proper descent of diaphragm in respiration. Had been discharged by two physicians as hopeless. No appetite, urine very scanty, could not rest from coughing. Put her upon Crataegus ten drops in wineglass of water four times a day, also very small doses of Aconite, Bryonia and Veratrum, once in two hours. Diet restricted to new milk and fresh eggs. After first week added Specific Medicine Collinsonia and Ipecac to the prescription. There was marked improvement in circulation and

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effusion in a few weeks, which continued until dropsy was entirely gone, and with continuance of the Crataegus alone has never returned. The throat and lung got better, and the lady is as well as most people of 70 years. A year later her husband came under treatment for disease of the heart. Had suffered for 30 years from attacks of suffocation which were increasing in frequency. Heart action very feeble and irregular; effusion in feet, limbs and one hand and arm. Attacks would last from a few minutes to six or eight hours, the intervals between growing shorter, and the attacks holding on longer. The same remedies, Crataegus, with *small doses* of Specific Medicine Aconite, Bryonia and Veratrum, as indicated, soon relieved the dropsical conditions and stopped the suffocating attacks. Patient continued comfortable under the treatment about six months, when he died from paralysis.

A gentleman of Richfield Springs, N. Y., suffered from angina pectoris for a number of years. In June, 1900, he was taken very much worse, having ten attacks during a night, so severe that it seemed that each successive attack must be the last. Had been in the habit of controlling them with $\frac{1}{16}$ grain tablets of glonoin, but at this time they seemed utterly without effect. Specific Crataegus in ten drop doses once in two hours, alternated with *small* doses of Specific Aconite, Veratrum vir. Bryonia, and Gelsemium as indicated, in half glass of water, two teaspoonsful once in two hours, alternately gave prompt relief and kept them off for two weeks when the medicine gave out.

A gentleman, of Bridgewater, N. Y., 80 years of age, had suffered from increasing heart trouble for eight or more years. In the fall of 1900, he could not lie down at all, limbs filled until the skin cracked open in many places and drip down into his shoes. The right limb about the ankle and on the calf of leg, finally had become gangrenous, the sore on calf being $3\frac{1}{2} \times 6$ inches and very offensive. Pulse very irregular 120 to 130. Had been eating beefsteak, potatoes, toast, preserves, etc., which I changed to milk and eggs, and finally, to milk alone. I gave Specific Crataegus in ten drop doses four times a day in water. A desert spoonful of Syrup of Phosphoric Acid an hour after the milk four times a day. A drachm of Echafolta and ten drops of Glonoin in half tumbler of water, two teaspoonful once in four hours, alternated with ten drops dist. ext. of Apocynum two hours apart. Sores were dressed with compress kept wet with 20 per cent. solution of Echafolta. In two months dropsy was gone, and the sores were healed with the exception of the large one which was reduced to the size of a quarter of a dollar, heart was regular, strength had returned, could lie down and sleep.

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Was bright, cheerful, and able to take care of himself. This, my long experience as a physician teaches me, was a desperate case and a marvelous cure.

CRATAEGUS IN THE TREATMENT OF HEART DISEASE.

BY M. C. JENNINGS, M. D.

Case I—Was that of a Mr. B., aged 73 years. I found him gasping for breath when I entered the room, with a pulse rate of 158 and very feeble; great œdema of lower limbs and abdomen. A more desperate case could hardly be found. I gave him fifteen drops of Crataegus in half a wineglass of water. In fifteen minutes the pulse beat was 126 and stronger, and breathing was not so labored. In twenty-five minutes pulse beat 110 and the force was still increasing, breathing much easier. He now got ten drops in same quantity of water, and in one hour from the time I entered the house he was, for the first time in ten days, able to lie horizontally on the bed. I made an examination of the heart and found mitral regurgitation from valvular deficiency, with great enlargement. For the œdema I prescribed hydrargyrum cum creta, squill and digitalis. He received ten drops four times a day of the Crataegus, and was permitted to use some light beer, to which he had become accustomed, at meal time.

He made a rapid and apparently full recovery until, in three months, he felt as well as any man of his age in Chicago. He occasionally, particularly in the change of weather, takes some of the Crataegus which, he says, quickly stops shortness of breath, or pain in the heart. His father and brother died of heart disease.

Case II—Was that of a young woman. I was met in the hallway of her home, as I entered, with the announcement that she was dead.

I found that she was not quite dead, though apparently so. I put five or six drops of nitrite of amyl to her nose, alternately pressing and relaxing the chest, so as to imitate natural breathing. I soon had her able to open her eyes and speak. I gave her hypodermically ten drops of the fluid extract, and in less than half an hour she was able to talk and describe her feelings. An examination revealed a painfully anæmic condition of the patient, but without any discoverable lesions of the heart, except functional.

The pulse was hardly perceptible for twenty minutes after she received the hypodermic injection; after that lapse of time it grew slowly strong and less numerous, and at the end of half an hour was fairly good.

A chronic dysentery and indigestion, which were responsible for her trouble, having been cured, the heart trouble and nervous state gradually responded to the general improvement until, at the end of ten weeks, the girl was in a perfect state of health.

She received ten drops of Crataegus, after meals, three times a day for one month—after that only occasionally. Her heart trouble, though very dangerous, was only functional, and resulted from the want of proper assimilation of the food due, chiefly, to the dyspeptic state of dysentery.

The forty other cases ran courses somewhat similar to those cited—all having been apparently cured. Yet, I am not satisfied, beyond a doubt, that any of those patients were completely cured, except those whose troubles of the heart were functional, like the second case cited. And it is possible, and even probable, that, in weather of a heavy atmosphere or when it is surcharged with electricity, or if the patient be subjected to great excitement or sudden and violent commotion or exercise, he may suffer again therewith. That the medicine has a remarkable

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influence on the diseased heart must, I think, be admitted. From experiments on dogs and cats, made by myself, it appears to influence the vagi and cardio-inhibitory centres, and diminishes the pulse rate, increases the intraventricular pressure, and thus filling the heart with blood, causes retardation of the beat and an equilibrium between the general blood pressure and force of the beat. Cardiac impulse, after a few days' use of the Crataegus, is greatly strengthened and yields that low, soft tone, so characteristic of the first sound, as shown by the cardiograph. The entire central nervous system seems to be influenced favorably by its use; the appetite increases and assimilation and nutrition improve, showing an influence over the sympathetic and the solar plexus. Also a sense of quietude and well-being rests on the patient, and he who, before its use was cross, melancholic and irritable, after a few days of its use shows marked signs of improvement in his mental state. I doubt if it is indicated in fatty enlargement. The dose which I have found to be the most available is from ten to fifteen drops after meals or food. If taken before food it may, in very susceptible patients, cause nausea. I find, also, that after its use for a month it may be well to discontinue for a week or two, when it should be renewed for another month or so. Usually three months seem to be the proper time for actual treatment, and after that only at such times as a warning pain of the heart or dyspnoea may point out.

Digitalis, in some form, should be used as an adjunct to the Crataegus.—*New York Medical Journal* 1896.

M. C. JENNINGS, M. D., Chicago, Ill.

The *Kansas City Medical Record* for April, contains a paper on Crataegus Oxyacantha in Angina Pectoris, which was read before the Jackson County (Missouri) Medical Society, by Dr. Joseph Clements, on March 25, 1898. Dr. Clements himself was the patient, and he records the onset of the disease and its progress up to two years ago. The attacks came frequently, the interval varying from two to three months to two to three weeks. Dr. Clements says: "I began with six drops, increasing to ten, before meals and at bed time. In twenty-four hours my pulse showed marked improvement; in two or three weeks it became regular, smooth and forceful. Palpitation and dyspnoea soon entirely left me; I began to walk up and down hills without difficulty, and a more general and buoyant sense of security and well-being has come to stay. After three or four months' use of the remedy, beginning over a year ago, and intermitting a week now and then; and an occasional use for a day or two once or twice since, every symptom of the disease has left me, so far as I can know myself. Of course, as to the permanency of these results time alone must declare; it is too recent a cure to be self confident about. As regards the *modus operandi* of the drug Dr. Clements says, but little is as yet known; it has been ascertained, however, that it exercises a remarkable influence over the vagus and sympathetic nerves. Shortly after its ingestion the cardio-inhibitory centers become active, the pulse rate is diminished and the intraventricular pressure is increased, filling the heart with blood, and thus bringing about an equilibrium between the general blood pressure and the heart's impulse."

Specific Indications and Uses.—Functional and organic heart affections, with pain, dyspnoea, præcordial oppression, rapid and feeble heart action; valvular insufficiency; cardiac hypertrophy; marked anemia; venous stasis; angina pectoris; endocarditis following inflammatory rheumatism.

Dose.—One to twenty drops in water three or four times a day. In urgent cases, ten drops every hour or oftener.

Angina Pectoris, With Especial Reference to the Use of *Crataegus Oxyacantha* in Its Treatment.*

BY DR. J. A. HOFHEIMER, M.D., New York.

American Medicine, New York, September, 1916.

The term "angina pectoris" is often mistakenly used as the name of a disease rather than that of a group of symptoms caused by various metabolic disturbances.

There are also many medical authorities who mention at the present day two types of this disorder, a true (*angina pectoris vera*) and a false (*pseudo angina pectoris*). Those who hold to there being two types of this affection, ascribe the so-called true angina to be due entirely to an atheromatous condition of the coronary arteries; and for many years this was the only form mentioned in the medical schools.

Within the past few years there has been a gradual change in the opinion of many observers. Some approach the subject by qualifying various concomitant disorders as being among the causative factors, while many still hold to the sclerotic condition of the coronary vessel theory. Several have taken the middle course, and the writer can not but agree with them. There is no doubt more than one causative factor is at work to cause the symptom complex, which for want of a better name we call angina pectoris.

Von Leube¹ states that "the origin of these attacks is probably to be attributed to the *sudden anemia of the myocardium* predisposed by arteriosclerosis of the coronary arteries, and the thereby impeded blood supply to the myocardium. * * * * But it is conceivable that a similar, although less dangerous final result may also be produced by vascular spasm; hyperirritability of the cardiac nerves, and toxic influences. * * * * I do not consider it necessary formally to separate a *sternocardia* which has occurred, on the basis of *angina pectoris vera* from *pseudo angina pectoris*."

Musser² writes that "the attack may occur in patients who are free from organic disease of the heart. It is, however, most commonly associated with some lesion." He further declares that "*hysterical or pseudo angina pectoris* can be distinguished only with extreme difficulty."

Louis Faugeres Bishop,³ in his recent book on "Arteriosclerosis," states: "Personally I have never in recent years made a diagnosis of *pseudo angina pectoris*. I think this name is silly. If a man has a severe cardiac pain, he has *angina pectoris*, because that is the only clinical name for the worst form of cardiac pain. The simplest kind of pain can develop into the most serious."

*"Angina Pectoris, with especial reference to the use of *Crataegus Oxyacantha* in its treatment,"—*American Medicine*, September, 1916, by J. A. Hofheimer, M.D., formerly Surgeon-in-Chief, Harlem Hospital, O. D. P., New York, Surgeon St. Elizabeth Hospital.

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If the practitioner would observe his patients who suffer from this disorder he will be convinced of the correctness of the assertion of Dr. Bishop. In the individual case we are able to notice pain of varying intensity at different attacks. Whether the pain is mild or severe, there can be no doubt of the distress from which the patient suffers, nor of the urgency with which relief should be given.

What is angina pectoris?

Lippincott's Medical Dictionary (edited by Dr. H. W. Cattell), gives as a definition "Spasm of the chest; a disease attended by acute pain, and syncope. * * * * * It is due to a sudden spasm of the systemic arteries, disease or aneurism of the aorta."

The observations of the writer have led him to believe that angina pectoris is essentially a cramp of the cardiac muscular fibers of varying intensity, which may occur at any point in the heart muscle, but apparently has its most frequent site at or about the aortic orifice, causing a partial stenosis.

The predisposition to these attacks may be due to changes which have taken place in the coronary arteries, affecting the circulation in the heart muscle itself, or to some metabolic change affecting the nervous, muscular and vascular structures generally. Anginoid attacks may be induced in many ways. Sufferers from this disorder are subjected to attacks upon the slightest muscular exertion, whether on a level surface or going up an incline; physical and mental overwork; violent emotions; unpleasant dreams, and very frequently fatal attacks have occurred during a spell of acute indigestion.

In all the cases which the writer has observed there has been a strong neurotic element as an exciting cause. The coronary vessels may or may not be diseased (if they are, the prognosis is more serious), but these vessels are *not* the only ones affected; the entire vascular system is more or less participant in the sclerotic changes going on in the economy. In fact, the general condition of arteriosclerosis which is present interferes with proper vaso-motor action, causing thereby a back pressure in the blood current, thus leading to greater distention of the myocardium. This overdistention acts as a stimulus to the inhibitory nerves of the heart; the cardiac muscle responds to this stimulus with a cramp-like or convulsive action, as is demonstrated by the palpitation, irregular rhythm and angina which follows. If this convulsive act is too prolonged or too "tonic" a sudden fatal termination will result.

It therefore becomes evident that we must search for the causes of the defective metabolism in order that we may ameliorate this condition, and remove them whenever possible; modifying diet, exercise and vocation. While the organic changes which have preceded these attacks may not be altered to any great extent by treatment later instituted, further disorganizing changes may be held in check by careful regimen, and proper medication.

The immediate relief demanded by an attack of angina has caused us to resort to the use of antispasmodics, such as amyl nitrite by inhalation, and the exhibition by mouth or by hypodermic injections of preparations containing digitalis, nitroglycerine, cactus, belladonna,

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etc.; and sedatives such as chloral hydrate, the bromides and often opiates.

These drugs have but a transient effect, and frequently the fear of an attack may develop a pernicious habit in a patient who has been given relief upon a former occasion by the injection of morphine.

Nitroglycerine is one of the most active antispasmodics, and is the drug best suited for the immediate relief of the present attack, but it does not effect a cure. It is handy for the patient to carry and is easy to take, by simply allowing a granule containing 1-100 to 1-250 of a grain to dissolve in the mouth, which it does instantly. The effect of this drug is obtained in a few seconds after taking; it imparts a slight tang to the tongue, and a sense of fullness in the head, which lasts from several minutes to a longer period. The headache which occasionally accompanies the exhibition of this drug may be considerably modified by ascertaining the minimum dose required in a given case in order to secure prompt relief.

Another drug to which my attention was called several months ago for the relief of these cases is the *Crataegus oxyacantha* (English hawthorn). I have used this drug frequently since it was first brought to my notice, not only in cases of severe angina pectoris, but also in many other cardiac disturbances.

Crataegus oxyacantha is a drug seldom mentioned in the textbooks of the "old school," as I have found after a fairly thorough search in many works on materia medica, without even finding the name of the plant spoken of. Therefore a brief resume of the history of this preparation may not be amiss:

Crataegus oxyacantha was first brought to the notice of the medical profession in the United States through the publication of an article on that subject by Dr. M. C. Jennings, of Chicago, in 1896, and again in 1898.⁴ (See pages 6 and 7.)

The medicinal virtues of hawthorn, however, were first made known to the profession through an Irish physician, Dr. Green, of Ennis, County Clare, who died in 1894.⁵

Dr. Joseph Clement⁶ claims that *crataegus oxyacantha* is a sovereign remedy for angina pectoris.

Dr. Thomas F. Reilly, professor of applied therapeutics at Fordham University Medical College, read a paper⁷ on this subject before the A. M. A. in June, 1909. He quotes the history of many cases to whom he had administered this drug, and states "in a few cases of non-compensating valvular disease, with symptoms in which there is an idiosyncrasy to the use of digitalis, it has afforded decided relief. * * * * * *Crataegus* is essentially a mild cardiac tonic. It is perfectly safe and has no poisonous effect. It can do no harm in aortic disease, and it is worthy of a trial in these troublesome cases. In fatty degenerations and in heart lesions associated with high arterial pressure it should be a useful agent."

Jennings, in his first paper, states his conclusions from its use in over forty cases, that "it appears to influence the vagi and the cardio-inhibitory centers, and diminishes the pulse rate. * * * * * The entire central nervous system seems to be favorably influenced by its

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use; the appetite increases and assimilation and nutrition improve, showing an influence over the sympathetic and solar plexus. Also a sense of quietude rests on the patient, and he who before its use was cross, melancholic and irritable, after a few days of its use shows marked signs of improvement in his mental state."

Strange as this last statement may appear, from actual experience I have been able to verify the marked sedative effect of crataegus upon the general system. Among the books referred to the writer has found the following statements about crataegus.

The United States Dispensatory⁸ merely gives two lines to this drug as follows: "The unripe fruits of the various species of crataegus or hawthorn, especially the *Crataegus oxyacantha* (English hawthorn) are used for their astringent and *reputed* cardiac properties."

The American Dispensatory⁹ has an article by Dr. Felter, who writes, "It is a curative remedy for organic and functional heart disorders, including cardiac hypertrophy, with mitral regurgitation from valvular insufficiency, and angina pectoris."

Fyfe's (Eclectic) *Materia Medica*¹⁰ mentions the indications for giving crataegus to be "cardiac neuralgia; palpitation; intermittent pulse with increased rate; extreme dyspnea on slight exertion, usually accompanied with pain in the cardiac region; valvular deficiency, with or without enlargement. Crataegus is a remedy of great power in both functional and organic wrongs of the heart. In angina pectoris and in valvular deficiencies most wonderful results have been obtained from its exhibition after the failure of some of the best known heart remedies."

Further references were also found attesting the beneficial action of crataegus in *Ellingwood's Therapeutist*, written by Dr. Ruff,¹¹ and Dr. R. W. Sharp.¹²

Since my own attention has been brought to the effectiveness of this drug, I have had considerable personal experience in its use, and have prescribed it in several cases, always with good results. The preparation which I have used has been the Specific Medicine of crataegus oxyacantha manufactured by Lloyd Bros., of Cincinnati.

Histories of a few of the cases treated with this drug follow:

Case I.—Dr. X., aet. 55, rheumatic history; mitral regurgitant murmur present for several years, accompanied by cardiac dilatation. He had noticed for the past two years infrequent attacks of dyspnea upon slight exertion. About May, 1915, he was subjected to these attacks more frequently. His work necessitated mounting several flights of stairs daily, and he noticed by the time July arrived that the slightest exertion would cause attacks of severe precordial pain, which would radiate to the left shoulder and arm. If the effort was persisted in, these pains would shoot up the side of the neck and into the face. A month later he was unable to walk a short block without being distressed. His sleep also became disturbed, and attacks of orthopnea and angina were of almost nightly occurrence.

A well-known specialist, who saw the case in consultation, advised absolute rest, and a practically non-protein dietary, forbidding all animal foods. He also suggested that the patient should take occa-

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sional doses of castor oil in combination with menthol and tincture of iodine (formula of Dr. G. K. Dickinson, of Christ's Hospital, Jersey City)¹⁸ also to use nitroglycerine tablets or pills, each containing 1-225 grain, as frequently as the attacks occurred, or preceding any anticipated exertion.

These directions were followed assiduously for over two months, without any noticeable benefit being derived therefrom. The patient grew weaker daily, and could barely walk from one chair to another in his room without having anginoid attack. There was at this time a constant sense of soreness over the left side of the thorax, and in the arm and hand of that side. His sleep had now become so disturbed that it was impossible for him to assume the recumbent posture (as change of position at once precipitated an attack), and he was compelled to secure what rest he could in a Morris chair, aided by several doses of bromide and chloral, occasionally augmented with small doses of codeia. Meanwhile he became very weak, nervous, hysterical and melancholic. The nitroglycerine gave but temporary relief, and frequently in less than half an hour the attacks would recur.

As apparently most of the so-called heart sedatives and regulators had been tried, without any lasting result or even marked improvement in the doctor's condition, at Dr. Thomas F. Reilly's suggestion a trial was made of *crataegus oxyacantha*. It was first given in combination with aconite. This, however, disagreed with the patient, who had shown an intolerance to aconite upon a former occasion, and the *crataegus* was therefore given alone. The first dose used was twenty drops of the "specific medicine" (Lloyd's), taken three times daily in water; this being gradually increased later until it was taken in fifty-drop doses.

Two days after commencing the exhibition of *crataegus* improvement was noticeable in the patient's condition. The intervals between attacks were longer, and he was able to obtain more sleep, though still in the sitting position and occasionally aided by bromides. He was allowed a more liberal diet, though the protein content was kept considerably lower than before his illness began.

In the latter part of December (about four weeks after beginning to take *crataegus*) the patient was able to go up and down one flight of stairs with but slight distress, and he resumed a portion of his office work. Walking would yet occasion twinges of precordial pain, but their severity was greatly modified. The nitroglycerine was taken only if the pain was severe, and many days would now elapse without its use being necessitated. It was not until the latter part of February, 1916, that he had improved sufficiently to be able to sleep in the recumbent position in bed.

At the time of writing this paper (July, 1916) the doctor has been able to resume his practice, and has performed several surgical operations within the past month without suffering from the anginoid attacks.

At the commencement of his severe attacks his blood-pressure registered 220 mm. Hg., systole; the urinalysis showed albumin, heavy trace; urea $8\frac{1}{2}$ grains per fluid ounce, and no casts. Since taking the

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crataegus the blood-pressure has fallen to 175 mm., and there is a marked diminution in the cardiac murmur, which formerly was very loud; the albuminuria has entirely disappeared. He continues to take the crataegus in forty-drop doses three times daily, and is able to go three and four weeks without necessitating the taking of the nitroglycerine.

While this case is not entirely cured, the sclerotic changes which had taken place previous to following this line of treatment still being largely in evidence, yet the further changes and cardiac spasms are held in check by the methods at present adopted. These include care of diet, relief of any intestinal stasis which may be present, moderation in occupation and exercise, and the taking of crataegus regularly.

Case II.—Mr. J. G., aet. 49. History of chronic bronchitis, with emphysema and bronchial asthma. No specific history. Urinalysis shows a trace of albumin, no casts, and urea 10 grains to the ounce. Blood pressure, 200 mm., cardiac action irregular, with pulse averaging 96-100 per minute; dyspnea upon slightest exertion. February 16, 1916, commenced taking crataegus in 10-drop doses every four hours. February 24, general improvement. Blood pressure, 145 mm. March 6, breathing and cardiac action considerably improved. Blood pressure, 140.

Soon after this, as the patient was feeling so much better, he concluded to discontinue treatment. On May 11th he again consulted me, complaining of his symptoms, which had again developed after he had "taken cold." The bronchial and cardiac conditions were similar to that found at the examination in February. His pulse at this time was 90, and the blood pressure was 180 mm. He was given crataegus in 20-drop doses with 10 drops of saturated solution of kalium iodide. May 15, patient's blood pressure to-day was 160, and his pulse, 76. May 23, condition unchanged; added tincture of digitalis in seven-drop doses to the crataegus. May 26, reports that he feels considerably better, and is able to sleep without interruption now from 10 p. m. until 5 a. m. June 6, improvement continues; patient states that "he feels lighter and breathes better." Pulse soft and regular, at 78 per minute; blood pressure is 140 mm. July 11, blood pressure is down to 135 mm., and urine is free of albumin. Is continuing taking crataegus, 30-drops twice daily.

Case III.—William G., Jr., aet. 18. Had recently been refused a policy in a well-known life insurance company, on account of "cardio-renal disease," albumin having been found in his urine. He is a robust appearing young man, five feet eight inches tall, and weighs 163 pounds. He has never had any serious illness, and his family history is excellent.

Examination of the heart reveals cardiac dilatation with a faint mitral systolic murmur, due to insufficiency. Blood pressure, 135 mm., and pulse 96. He admits that he frequently has noticed palpitation and slight precordial pain, especially after walking quickly. Several urinalyses have been made, showing uniformly high specific gravity (ranging from 1025 to 1040); increased acidity, and albumin present in a few specimens, especially in the evening urine, and only after partak-

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ing of a meal of high protein content, containing meat or eggs. No casts nor sugar found at any examination.

February 13, gave alkaline diuretics and specific medicine crataegus in ten-drop doses three times daily. March 5, slight improvement in cardiac action. No albumin. March 19, continued improvement. Now taking only crataegus in fifteen-drop doses twice daily. April 16, has been re-examined by insurance company's doctors and has been issued a policy. July 9, he has been steadily taking crataegus twice daily since last note. Examination to-day shows a heart regular in action, without murmur; pulse, sitting, 75; after hopping, 90. No distress over cardiac region; blood pressure, 130, and urine free of albumin.

Case IV.—Mrs. A. W., aet. 39, primipara. April 10, the patient had to be assisted up the stoop to my office. Her present distress was intense; pains over the heart; orthopnea; livid countenance, and anxious facies.

For the past month she suffered frequently from similar attacks, and was unable to walk more than a block or two without their recurrence. They always occurred upon assuming the recumbent posture; and at times she noticed sibilant rales, but had very little cough or expectoration. Occasionally there were vertiginous spells; appetite was good, and bowel action regular. There was no rheumatic history. Auscultation revealed no adventitious pulmonary sounds; respirations were 36 per minute; pulse, 105; temperature, normal. The cardiac area was greatly enlarged, with tremulous action and a decided trill on palpation over the apex. Blood pressure, systole, 260 mm., diastole, 165 mm. Urinalysis shows specific gravity, 1020; faint trace of albumin; urea, 7 grains per ounce, and no casts. She was ordered to rest in any position most convenient to her comfort, and to take tincture of digitalis, five-drop doses, in combination with crataegus, ten drops, every four hours. Also to take a tablet of glonoin, 1-200 grain, whenever attacks recurred. April 17, the patient states that she can now lie down in bed without distress, using only one pillow. To-day she walked to my office (a distance of eight blocks from her home) without suffering the former discomfort. Her blood pressure registered 220 mm., and pulse is 90 per minute. There is still slight tachycardia, but the heart sounds are normal. Digitalis increased to ten drops and crataegus to fifteen drops four times daily. April 28, continues to improve. May 9, reports that she "feels fine," and is doing her own housework and has had no further attacks. Urine free of albumin; blood pressure, 215 mm., and pulse 86. Advised that she should continue taking crataegus alone in fifteen-drop doses four times daily. July 22, heard from patient through one of her family, who reports that she had gone to the country, and that she still takes crataegus, but has not had an attack since last noted.

Case V.—Mrs. G., aet. 45; has been suffering from tachycardia, arrhythmia, double mitral murmur and aortic stenosis. Her pulse ranges from 90 to 190 beats per minute. She has complained of "palpitation and heart pains" for over a year, noticeable upon the slightest exertion; her appetite is poor; constipation, and occasionally headaches.

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Sometimes dyspnea is present and at such times she is unable to assume the recumbent position.

She was advised to relinquish all work, and lie down as much as possible. Codeia, digitalis and strophanthus were given to her to ease the pain and regulate the heart action. Castor oil was administered as needed to maintain good bowel action. While the pulse rate was lowered, the pains and other discomforts would make themselves manifest upon the slightest exertion. January 6, 1916, I began to use crataegus in her case; first giving it in ten-drop doses every four hours, and gradually increasing it up to twenty-drop doses. March 27, she reports only slight distress upon walking, and is able to perform light household duties. She is also now able to sleep in bed with her head low. The double mitral murmur is still heard; her pulse is 90 (after having walked to my office); and general improvement in her physical condition is noticeable. Gave a chalybeate tonic in addition to continuing the crataegus. May 11, improvement continues. June 5, patient shows great improvement in her appearance, and states that she suffers from no discomfort at present, although she has walked to my office from her home after having worked at ironing clothes for over an hour. Pulse, 78; heart murmur very faint, and patient has gained over five pounds in weight.

Case VI.—Mrs. J., aet. 57; has had frequent mild anginoid attacks for more than a year. Examination shows an intermittent pulse at irregular intervals; rough systolic mitral murmur; blood pressure, 175 mm., systole, and pulse 78-90. After taking crataegus a few weeks the angina disappeared, and the pulse became more steady and regular. Her son, a physician, reports that she continues to improve, and is only taking crataegus; also that while formerly there was a slight albuminuria this has now disappeared.

From the foregoing cases we can see that crataegus oxyacantha acts as a valuable sedative and regulator of the heart and blood vessels. It is the writer's belief that it acts mainly through its influence upon the inhibitory nerves of the heart, and thereby through the entire vasomotor system. It does not increase blood pressure by stimulating the heart, but seems, on the contrary, to establish an equilibrium between the heart and the blood vessels; thus *regulating* the blood pressure and reducing it if it be too high. It likewise slows the heart action, without having any depressant effect.

As Dr. Reilly has stated,¹⁴ "its action is non-poisonous," and it can be given without fear of digestive disturbance, as it is very agreeable to the taste. The action of the drug is slow unless given in large doses; but I think it wiser to give the drug in steadily increasing dosage until the desired effect is obtained, and to maintain that dose for an extended period, which should be determined by the results.

It is well to note that occasional doses of digitalis in combination with the crataegus adds to the efficiency of both drugs, especially is this true if there is any nephritic involvement or considerable cardiac dilatation. Transient albuminuria is a frequent concomitant of the symptom complex of angina pectoris, and in all my cases this has either

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disappeared entirely, or has been greatly lessened after the exhibition of crataegus.

Diet should also be carefully considered. A limited protein dietary in the plethoric cases, with a more liberal one to those who show evidence of anemia, is desirable.

Withdrawal of the proteins will often cause a shock if the supply is reduced too radically, and a marked feeling of exhaustion follows, reacting badly upon the patient.

High proteid poisoning is like any other stimulating systemic poisoning, and is best dealt with by a gradual diminution until proper conditions are approximated. The proteins of some foods seem to have a more energetic or poisonous action upon the economy than that of others. Each individual also apparently has a personal idiosyncrasy, and it is necessary to study this factor as no general rule will suit all cases.

Every patient who is subject to anginoid attacks should be taught to study himself with reference to the articles of diet which most readily "agree" with him; not those which taste best nor those which he craves. The physician can aid by supplying the patient with a suitable diet list, of sufficient caloric value, but of lower proteid content than that which the patient formerly indulged in.

Thus with proper food supervision; moderate exercise; regulation of digestive and excretive function; normal sleep, and mental occupation without exhaustion, supplementing the exhibition of crataegus oxyacantha we will go a long way toward effecting a marked amelioration of the conditions which tend to cause angina pectoris.

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From the original Specific Medicine Crataegus label:

Specific Medicine Crataegus is a tonic to the heart and blood vessels. It is adapted to both functional and organic heart disorders characterized by pain, oppression in the heart region, shortness of breath, rapid and feeble heart action, with evidence of cardiac hypertrophy, valvular insufficiency, and profound anemia. It has given excellent results in cardiac hypertrophy, with mitral regurgitation from valvular insufficiency, in valvular deficiency without hypertrophy, in tachycardia, cardiac neuralgia, pericarditis, endocarditis, myocarditis, so-called rheumatism of the heart, dropsy depending upon weak heart action, and in apoplexy, vertigo, spinal hyperemia, and venous stasis.—Ellingwood.

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